FM 3-1 Copy 2 ch 1,

FIELD MANUAL

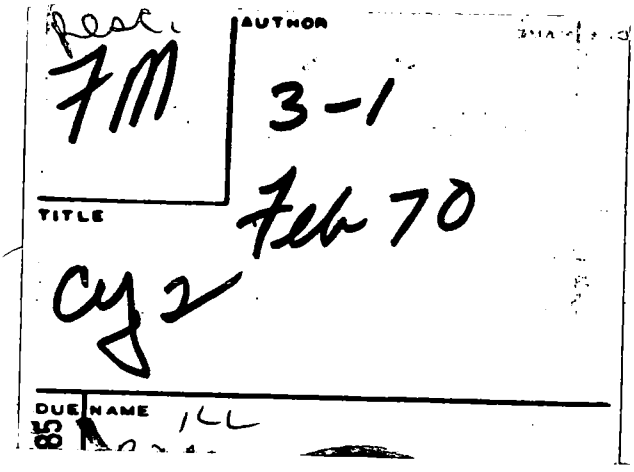
RESCINDED for DA Circular 310-27 April 1980

CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL (CBR) SUPPORT

Pentagon Library (ANR-PL)
ATTN: Military Documents Section
Room 1A518, Pentagon
Washington, DC 20310-6050

HEADQUARTERS, DEPARTMENT OF THE ARMY
FEBRUARY 1970

TAGO 7729A


Resc
FM
AUTHOR
3-1
TITLE
Feb 70
cy 2
DUE
NAME
85

RESCINDED For DA Circular 310-27
April 1980

CHANGE
No. 1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 4 June 1971

CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL (CBR) SUPPORT

FM 3-1, 6 February 1970, is changed as follows:

1. Remove old pages and insert new pages as indicated below.

Old pages	*New pages*
i	i
5-5 and 5-6	5-5 and 5-6
7-1 and 7-2	7-1 and 7-2
8-1 and 8-2	8-1 and 8-2
9-1 through 9-6	9-1 through 9-6
A-1 through A-3	A-1 through A-3
----------	B-1 through B-6

2. A star indicates new or changed material.

3. File this change sheet in the front of the manual for reference purposes.

By Order of the Secretary of the Army:

W. C. WESTMORELAND,
General, United States Army,
Chief of Staff.

Official:

VERNE L. BOWERS,
Major General, United States Army,
The Adjutant General.

Distribution:

To be distributed in accordance with DA Form 12-11 requirements for Chemical, Biological and Radiological Operations.

Pentagon Library (ANR-PL)
ATTN: Military Documents Section
Room 1A518, Pentagon
Washington, DC 20310-6050

RETURN TO ARMY LIBRARY
ROOM 1 A 518 PENTAGON

FIELD MANUAL
No. 3–1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *6 February 1970*

CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL (CBR) SUPPORT

		Paragraphs	Page
CHAPTER 1.	INTRODUCTION	1–1—1–3	1–1
2.	GENERAL CHEMICAL LABORATORY	2–1—2–19	2–1—2–5
3.	CLOTHING IMPREGNATION		
Section I.	Introduction	3–1—3–4	3–1, 3–2
II.	Chemical Processing Company	3–5—3–24	3–2—3–5
CHAPTER 4.	CBR SUPPORT DECONTAMINATION		
Section I.	Introduction	4–1—4–3	4–1—4–3
II.	Decontamination Team, FB	4–4—4–11	4–3—4–4
CHAPTER 5.	SUPPORT TEAMS		
Section I.	Introduction	5–1—5–7	5–1
II.	Chemical Combat Support Team, PA	5–8—5–20	5–1—5–4
III.	Other Support Teams	5–21—5–26	5–5—5–11
CHAPTER 6.	CBR TECHNICAL INTELLIGENCE	6–1—6–6	6–1—6–3
7.	SUPPLY, MAINTENANCE, AND AMMUNITION SERVICE		
Section I.	Supply	7–1—7–4	7–1
II.	Maintenance	7–5—7–8	7–1, 7–2
III.	Ammunition Service	7–9—7–12	7–2, 7–3
CHAPTER 8.	STAFF SERVICES		
Section I.	Introduction	8–1, 8–2	8–1
II.	Functions and Responsibilities	8–3—8–10	8–1, 8–2
CHAPTER 9.	PLANNING CBR COMBAT SERVICE SUPPORT		
Section I.	Planning Phases and Factors	9–1—9–6	9–1—9–5
II.	Planning for Use of Indigenous Labor	9–7—9–9	9–5
★III.	Impact of Chemical and Enemy Biological and Nuclear Weapon Employment	9–10—9–11	9–5
APPENDIX A.	REFERENCES		A–1
★B.	ORGANIZATION AND OPERATIONS OF CBR ELEMENT AND CBR CENTER		B–1
INDEX			Index–1

* This manual supersedes FM 3–1 (Test), 23 January 1967.

CHAPTER 1

INTRODUCTION

1–1. Purpose and Scope

a. This manual gives general guidance for commanders, staff officers, and other personnel concerned with the organization and employment of chemical units and teams that provide CBR combat support and combat service support.

b. It discusses chemical units and teams that provide chemical laboratory, clothing impregnation, CBR decontamination, CBR element, CBR agent sampling and analysis, CBR reconnaissance, CBR staff (special forces), mechanized flamethrower, tactical riot control agent, flame, defoliation, and personnel detector support. It also discusses staff services and staff planning for CBR combat service support.

c. This manual includes general information pertaining to functionalized units that provide clothing impregnation, CBR decontamination, CBR technical intelligence, supply of CBR materiel, maintenance of chemical equipment, and ammunition service for chemical ammunition. It gives references to other publications which contain detailed information pertaining to these functionalized units and the services they provide.

d. This manual does not include the combat support provided by chemical smoke generator units and the chemical mechanized flame company, as details pertaining to this support are contained in FM 3–50 and FM 20–33, respectively.

e. The material in this manual is applicable as appropriate to—

(1) General war, to include a consideration of the employment of and protection from nuclear, and chemical, weapons and protection from biological weapons; and operations in nuclear, chemical, or biological environments.

(2) Limited war.

(3) Cold war.

1–2. Stability Operations

a. Chemical units capable of assisting in stability operations include chemical smoke generator units, the chemical mechanized flame company, and the following TOE 3–500 teams:

(1) Chemical combat support team, PA.

(2) Decontamination team, FB.

(3) Mechanized flamethrower teams, NA and NB.

b. The support provided by chemical units includes—

(1) The employment of herbicides, riot control agents, smoke, and flame.

(2) The use of personnel detectors.

(3) The provision of decontamination.

(4) The provision of mobile shower service.

(5) The use of sprayers in insect control.

c. FM 31–16 and TC 3–16 contain information pertaining to the employment of herbicides, riot control agents, smoke, and flame in counterguerrilla activities of stability operations. TC 3–16 also contains information pertaining to the use of personnel detectors.

d. Chemical officers serve as advisers in stability operations and provide advice and assistance in the employment of chemical agents and in the defense against the enemy use of chemical and biological agents.

1–3. Recommended Changes

Users of this manual are encouraged to submit recommended changes and comments to improve the manual. Comments should be keyed to the specific page, paragraph, and line of the text in which the change is recommended. Reasons will be provided for each comment to insure understanding and complete evaluation. Comments should be prepared using DA Form 2028 (Recommended Changes to Publications) and forwarded direct to the Commanding Officer, U.S. Army Combat Developments Command Chemical-Biological-Radiological Agency, Fort McClellan, Alabama 36201.

CHAPTER 2

GENERAL CHEMICAL LABORATORY

2–1. Mission

a. Primary. The primary mission of the general chemical laboratory (TOE 3–97) is to provide chemical testing and analysis for chemical, biological, and radiological activities in the theater of operations.

b. Secondary. Within priorities established by the theater commander, the secondary mission of the laboratory is—

(1) To provide theater laboratory development of field expedient CBR devices and measures.

(2) To provide theater laboratory analysis of chemicals and other items either procured or stored in the theater.

2–2. Assignment and Allocation

The general chemical laboratory is normally assigned to the theater army and is placed under the operational control of the theater army support command (TASCOM). It may be assigned to the corps support command of an independent corps-size force. It is allocated on the basis of one or more per theater of operations, as required, and one per corps support command.

2–3. Capabilities

a. The laboratory has a major capability to identify chemical and radiological agents and to perform laboratory analysis of CBR materiel in support of the theater intelligence mission.

b. Within priorities established by the theater commander, the laboratory has the capability—

(1) To provide theater laboratory development of field expedient CBR devices and measures in support of the theater operational mission.

(2) To provide theater laboratory analysis of chemicals and other items either procured or stored in the theater in support of the theater supply mission.

(3) To conduct—within equipment and personnel limitations—studies, experiments, and research projects as authorized and directed by the theater commander.

2–4. Limitations

a. The laboratory is not adaptable to a type B organization.

b. The unit is dependent upon other units for an adequate supply of purified water, mess, motor vehicle maintenance, supplemental transportation, medical service, and religious support. It is dependent upon the personnel service company (TOE 12–67) for personnel and administrative services.

c. While individuals of the unit can engage in effective, coordinated defense of the unit's area or installation, the unit is dependent upon other organizations for assistance in local security of installations against hostile ground attack.

2–5. Mobility

The unit has only about 5 percent ground mobility with organic vehicles. It has 100 percent air transportability in medium transport aircraft.

2–6. Organization

The general chemical laboratory (fig. 2–1) consists of three sections: headquarters, laboratory, and intelligence. The laboratory section consists of a headquarters and six operational laboratories: organic chemistry, inorganic chemistry, instrument, toxicology, radiological physics, and chemical engineering.

2–7. Functions

a. Headquarters Section. Functions of personnel include command, supply, personnel administration, and other unit administrative duties.

b. Headquarters of Laboratory Section. Functions of personnel include the directing and coordination of the activities of the six operational laboratories; maintenance of a technical library; power generator organizational maintenance; and clerical, carpenter, and plumber duties.

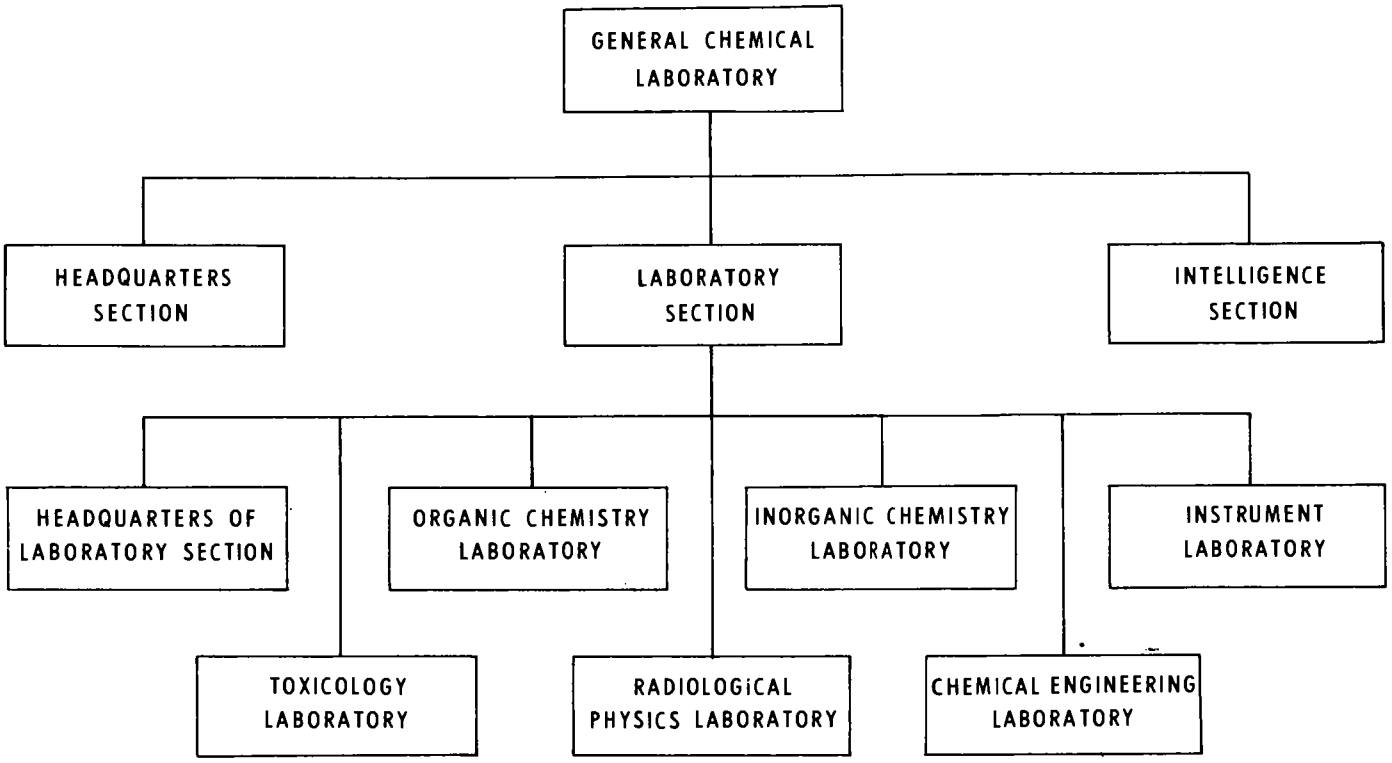


Figure 2–1. Organization of general chemical laboratory.

c. Organic Chemistry Laboratory. Functions of personnel include the identification of organic compounds and suspect chemical agents, the performing of microorganic and macroorganic analyses, and the separation and purification of chemical agents for analysis by the instrument laboratory or other operational laboratories.

d. Inorganic Chemistry Laboratory. Functions of personnel include the performing of qualitative and quantitative elemental analyses at micro and macro levels, preparation of samples for analysis by the instrument laboratory, and performing of qualitative and quantitative testing of protective masks, protective clothing, paints, foodstuffs, chemicals, and other materials.

e. Instrument Laboratory. Functions of personnel include the use of electronic instruments to analyze samples submitted by the organic and inorganic chemistry laboratories and the maintenance and repair of the instruments.

f. Toxicology Laboratory. Functions of personnel include the performing of toxicological tests, the determination of the physiological effects of chemical agents submitted to the organization for analysis, and the maintenance of animals needed for test and experimental purposes.

g. Radiological Physics Laboratory. Functions of personnel include the separation, purification, and radiochemical analysis of radioactive materials and suspect enemy radiological agents.

h. Chemical Engineering Laboratory. Functions of personnel include the developing of field expedient items and procedures for use in chemical and biological (CB) agent detection, CBR agent sampling, and CBR protection and decontamination; the designing, building, and operating of small-scale equipment for the production of chemicals required to support temporary CBR countermeasures and devices; and the tapping and sectionalizing of defuzed and rendered safe chemical and biological ammunition for the purpose of obtaining samples of the agent filling.

i. Intelligence Section. Functions of personnel include the evaluation from an intelligence stand-

point of the data generated by the operational laboratories' analysis and testing of unidentified or enemy materiel, the examination of information obtained from the operational laboratories for indications revealing the enemy's state of preparedness for CBR operations and protection, and the tanking of still photographs of materiel for identification and intelligence purposes. Because these intelligence functions are beyond the capability of —and supplement the activities of—the military intelligence company, technical intelligence (para 6–4*a*), liaison is established between the laboratory's intelligence section and the technical intelligence company.

2–8. Laboratory Support

a. The general chemical laboratory provides laboratory support on a theaterwide basis. It provides this support not only to Army forces but also to other U.S. armed forces including the Air Force, Navy, and Marine Corps in accordance with AR 1–35.

b. Staff supervision of the laboratory operations normally is exercised by the TASCOM chemical officer. Priorities for laboratory operations in support of Army forces are established by the theater army commander. Coordination of laboratory support for other elements of the armed forces is made by the theater army chemical officer in accordance with operational priorities established by the theater commander.

2–9. Operational Equipment

a. The principal item of equipment used in the operation of the general chemical laboratory is the M2A1 base chemical laboratory. It consists of approximately 2,000 individual items including general and specialized laboratory apparatus, glassware, chemicals, testing devices, electronic instruments, specialized radiac equipment, cages for test animals, and a technical library. Components of the base chemical laboratory are used in equipping each of the operational laboratories.

b. Other items of equipment include an ABC–M19 CBR agent sampling and analyzing kit, electrical generators, light illumination and heating equipment, photographic equipment, standard radiac instruments, drafting equipment, and tool kits.

2–10. Location

The general chemical laboratory is located in the communications zone and normally in the vicinity of the TASCOM headquarters, which designates the general area for the location of the laboratory. The laboratory commander, after making a reconnaissance of the area, selects a site for the laboratory. He also selects an alternate site for use if military operations necessitate movement of the laboratory.

2–11. Site Selection Factors

a. A site in an urban area is desirable where utilities—including water, electricity, and gas—and sewage facilities are available.

b. Approximately 5,200 square feet of covered floor space are required for the operational laboratories. An existing building—preferably one designed for laboratory purposes—is desirable. The exacting, technical work of the laboratories requires that the building be weatherproof and adaptable for heating. It is desirable that floors be concrete to help keep the room atmosphere relatively dust-free. If a suitable building is not available, the general chemical laboratory will be dependent upon engineer construction units to construct or rebuild the required facilities. In an emergency, tents may be used to provide the necessary covered space.

c. Covered space requirements for the general chemical laboratory headquarters and the intelligence section total approximately 640 square feet.

2–12. Arrangement of Site

a. The site should be arranged so that work can be efficiently performed by each element of the laboratory.

b. The working areas for the headquarters and administrative personnel should be located apart from the area occupied by the operational laboratories.

c. An area for the storage of laboratory operating supplies and for materiel awaiting analysis, test, or evaluation should be suitably located.

d. Housing facilities for personnel of the laboratory organization should be conveniently near the laboratory building.

2–13. Establishment of the Laboratory

a. After the laboratory building has been selected, a floor plan is prepared, equipment is unpacked, and the laboratory is arranged according to the plan.

b. The organization's electrical generators and lighting and heating equipment are installed and made ready for use whenever these facilities are not otherwise available.

c. When improvisation is necessary, the boxes and crates in which the base chemical laboratory components are packed may be converted into laboratory tables by the addition of table tops and the installation of shelves as shown in TM 750–5–16.

d. The services of the plumber, power generator operator-mechanic, machinist, carpenter, and other laboratory personnel are used in the installation of water, gas, and sewer lines; electrical wiring; tables; shelves; and other laboratory fixtures and equipment.

2–14. Water Requirements for Operational Laboratories

The operational laboratories require substantial quantities of water daily for the washing of laboratory glassware and apparatuses and for other normal operations. Additionally, they require a readily available supply of water for use in flushing or clean-up operations in event of accidental spillage of chemicals or other hazardous substances. It is desirable that existing water mains be used as a source of water, but if they are not available the laboratory organization will be dependent upon other units for its water supply.

2–15. Security

a. The laboratory commander is responsible for the security of the laboratory and for the preparation of a laboratory security plan.

b. Security measures should include—

(1) Adequate guarding of the laboratory area at all times.

(2) Prevention of unauthorized personnel from gaining access to the laboratory area.

(3) Action to prevent sabotage and other forms of covert attack.

(4) Measures to prevent enemy knowledge of the laboratory location and operation.

(5) Safeguarding of classified information, documents, and materiel in compliance with applicable army regulations of the 380-series.

(6) Communications security measures to minimize enemy signal intelligence on friendly communications.

2–16. Reports and Records

a. The reports of the results of the laboratory scientific work and investigation and the reports of the intelligence section are submitted by the laboratory commander to the TASCOM assistant chief of staff, security, plans, and operations. Progress reports are submitted as required. Upon completion of a project, a detailed final report is submitted.

b. Appropriate records of assigned projects and of the laboratory work are maintained. A detailed record of each test animal used by the laboratory is also kept.

2–17. Internal Coordination

Close coordination between various laboratory elements engaged on a project is essential to efficient operations. For example, several elements may be engaged in the processing of a captured shell. The processing may include photographing the shell by the intelligence section for identification purposes; tapping or sectionalizing the shell by the chemical engineering laboratory to obtain samples of agent filling; analyzing the samples by the organic chemistry laboratory; testing the samples by the toxicology laboratory to determine toxicity; and evaluating the test results from an intelligence standpoint by the intelligence section.

2–18. Coordination With Other Units

a. The general chemical laboratory maintains coordination with other units concerned with the operations of the laboratory. These units include the medical laboratory; explosive ordnance disposal (EOD) detachment; military intelligence company, technical intelligence; CBR technical intelligence collection team; CBR agent sampling and analysis team; CBR reconnaissance teams; and field depots.

(1) After obtaining samples of agent filling from unidentified or enemy biological ammunition, the general chemical laboratory forwards the samples to the medical laboratory (TOE 8–650) for identification. It also sends to the medical laboratory samples of new enemy chemical agents for development of proper treatment of casualties.

(2) After defuzing and rendering safe captured chemical and biological ammunition, the EOD detachment GA (TOE 9–520) forwards the ammunition through intelligence channels to the general chemical laboratory for tapping or sectionalizing to obtain samples of agent filling.

(3) The military intelligence company, technical intelligence (TOE 30–34); CBR technical intelligence collection team (TOE 30–600 team, LK); CBR agent sampling and analysis team (TOE 3–500 team, KA); CBR reconnaissance team (TOE 3–500 team, LA); and special forces (SF) CBR reconnaissance team (TOE 3–500 team, LB) forward to the general chemical laboratory for analysis and identification samples of unknown chemical agents and samples of radiological agents and radioactive contamination.

(4) The field depot (TOE 29–512) forwards to the general chemical laboratory surveillance samples of stored chemical supplies for the determination of serviceability.

b. The relationship of the general chemical laboratory with a coordinated theater CBR agent detection and identification system is depicted graphically in FM 21–40.

2–19. Communication

The general chemical laboratory is equipped with one telephone for communication between laboratory headquarters and higher headquarters.

CHAPTER 3

CLOTHING IMPREGNATION

Section I. INTRODUCTION

3–1. General

Clothing impregnation is the process of impregnating permeable clothing with chemicals (impregnite). Impregnated clothing provides the wearer with protection of the skin against the vapors and small droplets of blister agents, which are neutralized by the impregnite. Protection against nerve agents is provided by the physical barrier created by the impregnite and to a limited extent by neutralization. Impregnated clothing is also known as permeable protective clothing.

3–2. Types of Permeable Protective Clothing

Two types of permeable protective clothing have been standardized. One is the chemical protective clothing outfit which is standard-A, and the other is the vesicant agent protective ensemble which is standard-B. Components of the outfit and ensemble are listed and described in TM 10–277.

3–3. Provision of Clothing Impregnation Service

a. Chemical Processing Company. The large-scale impregnation or reimpregnation of clothing is a primary function of the chemical processing company (TOE 3–77). The company is employed in the communications zone. The assignment, capabilities, organization, and operations of the company are discussed in section II.

b. Laundry and Renovation Company, General Support. Laundry elements of the laundry and renovation company, general support (TOE 10–437) are capable of supporting clothing impregnation operations at 50 percent of their laundry capability. The laundry capability is approximately 33,000 pounds of laundry per week in support of renovation activities and items for return to depot stocks. The company is employed in the communications zone. It is assigned to a field depot (TOE 29–512) of TASCOM's supply and maintenance command and is allocated on the basis of one company per 50,000 troops supported.

c. Supply and Service Company, Direct Support. Laundry elements of the supply and service company, direct support (TOE 29–147) are capable of providing emergency clothing impregnation service at approximately 50 percent of their laundry capability. The company provides laundry service for nondivisional troops in the theater of operations. On the basis of 6 pounds of laundry per man per week, the company is capable of providing laundry service for approximately 16,600 troops when employed in the field army service area and for approximately 17,800 troops when employed in the communications zone. In the field army service area, the company is assigned to field army support command (FASCOM) and in the communications zone to theater army support command (TASCOM). The organization and operations of the company are discussed in FM 29–3–1.

d. Field Service Company, General Support, Forward. Laundry elements of the field service company, general support, forward (TOE 29–114) are capable of providing emergency clothing impregnation service at approximately 50 percent of their laundry capability. The company operates in a corps rear area and is capable of providing bulk laundry in support of approximately 13,650 divisional troops on the basis of 6 pounds of laundry per man per week. The company is assigned to FASCOM and allocated on the basis of one company per division. The organization and operations of the company are discussed in FM 29–45–1 (Test).

e. Field Service Company, General Support, Army. Laundry elements of the field service company, general support, army (TOE 29–124) provide reclamation laundry service and backup laundry support for direct and general support units or, when required, emergency clothing impregna-

tion service. The company is employed in the field army service area. It is assigned to the army support brigade and allocated on the basis of two companies per field army service area. The organization and operations of the company are discussed in FM 29–45–1 (Test).

3–4. Clothing Impregnation Procedures

Clothing impregnation procedures for the chemical processing company are contained in TM 3–409. Procedures for laundry elements are contained in TM 10–280.

Section II. CHEMICAL PROCESSING COMPANY

3–5. Mission

a. Primary. The primary mission of the chemical processing company (TOE 3–77) is to impregnate or reimpregnate with chemicals clothing worn for protection against chemical agents.

b. Secondary. The secondary mission of the company is to operate as a fixed field laundry.

3–6. Assignment and Allocation

The company is normally assigned to a field depot (TOE 29–512). It may be assigned to the corps support command of an independent corps-size force. The company is allocated on the basis of one per 88,000 troops supported in climatic zones I and II or one per 64,000 troops supported in climatic zones III through VII. Information about these zones is contained in CTA 50–902.

3–7. Capabilities

a. Processing capabilities of the company, which is equipped with two clothing impregnating plants, vary according to the company's strength levels.

(1) At full strength (level 1) the company is capable of processing approximately 88,000 uniforms per month in climatic zones I and II or approximately 64,000 uniforms per month in climatic zones III through VII.

(2) At reduced strength (level 2) the company is capable of processing approximately 70,400 uniforms per month in zones I and II or approximately 51,200 uniforms per month in zones III through VII.

(3) At reduced strength (level 3) the company is capable of processing approximately 66,000 uniforms per month in zones I and II or approximately 48,000 uniforms per month in zones III through VII.

b. Each of the two platoons of the company is capable of separate operations and can operate a clothing impregnating plant continuously on a two-shift-per-day basis.

c. The company is adaptable to a type B organization.

d. Individuals of the company can engage in effective, coordinated defense of the company's area or installation.

3–8. Limitations

a. The company is dependent upon other units for motor vehicle maintenance, supplemental transportation, medical service, and religious support.

b. When clothing impregnating plants are located at a distance of more than 120 meters from a source of water such as water mains or a river or other natural source, the company will be dependent upon engineer water supply units or water transport teams for the supply of water for plant operations.

c. When organized with a type B organization, the company is dependent upon other units for interpreters and translators.

3–9. Mobility

The company has 10 percent ground mobility with organic vehicles. It has 100 percent air transportability in medium transport aircraft.

3–10. Organization

The chemical processing company (fig. 3–1) consists of a company headquarters and two platoons, each of which is composed of a platoon headquarters and two sections.

3–11. Functions

a. Company Headquarters. Functions of company headquarters personnel include command and supply, personnel administration, and other unit administrative duties, and power generator organizational maintenance.

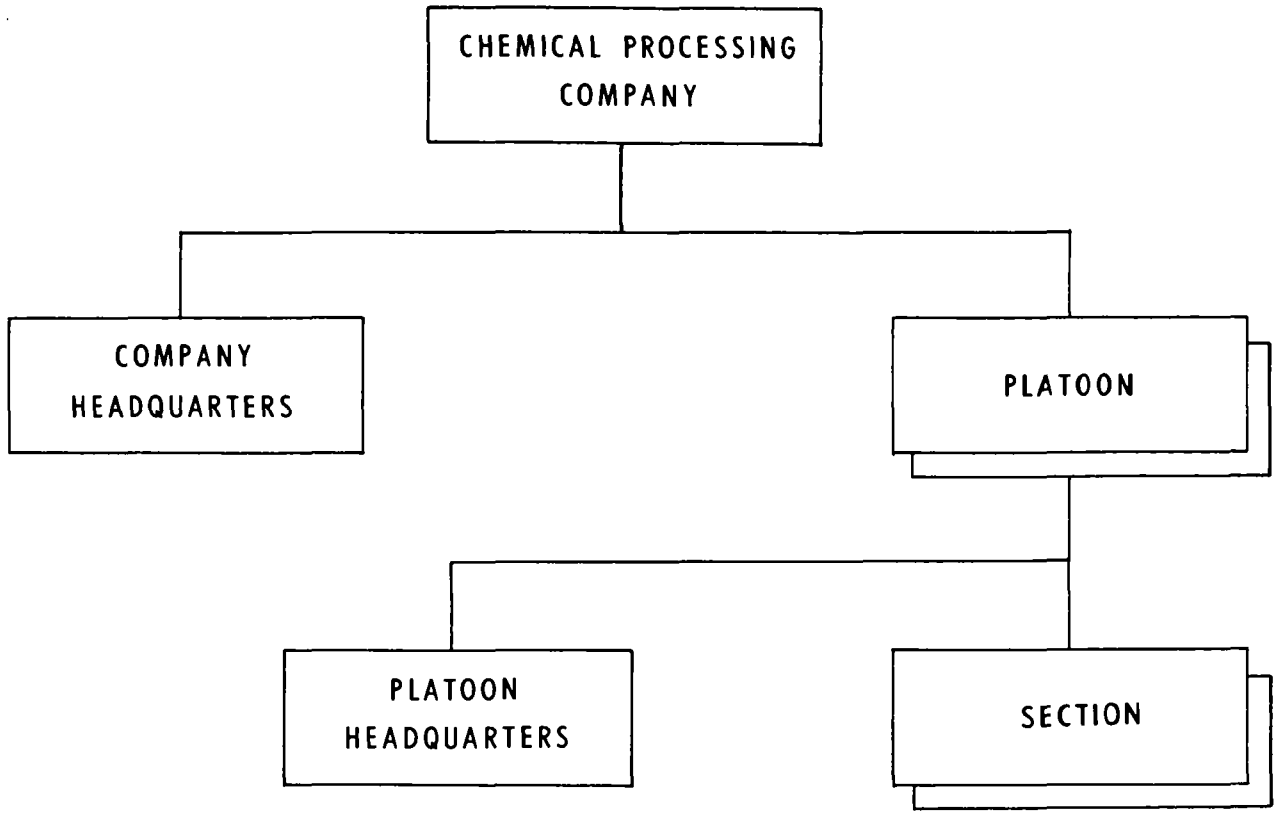


Figure 3–1. Organization of chemical processing company.

b. Platoon Headquarters. Functions of platoon headquarters personnel include command responsibilities, supervision of clothing impregnating plant operations, organizational maintenance of plant equipment, and operation of the plant's chemical laboratory.

c. Section. The function of section personnel is the operation of a clothing impregnating plant for one 12-hour shift.

3–12. Clothing Impregnating Plant

The principal item of mission equipment is the clothing impregnating plant. The plant includes clothing impregnating and drying machines, impregnating suspension tanks, steam generator, fuel storage tank, pumps, piping, chemical laboratory, and equipment essential to the assembling and installation of the plant. TM 3–409 contains an overall view of the plant and information pertaining to the operation and organizational maintenance of the plant equipment.

3–13. Auxiliary Equipment

Auxiliary equipment used in the operation of the clothing impregnating plant includes a 3,000-gallon fabric water storage tank, a water transfer pump for filling the water storage tank, electric generators, scales, and tables. Information about the operation and organizational maintenance of the items of auxiliary equipment is also contained in TM 3–409.

3–14. Operational Supplies

Large quantities of impregnating materials and other operating supplies are used in the impregnation of clothing. Allowances for these supplies are contained in SB 700–50. A listing of the supplies needed for a 24-hour-per-day operation of a clothing impregnating plant is contained in FM 3–8.

3–15. Location

The chemical processing company normally is located in the vicinity of the field depot to which it is assigned. The general area for the company is designated by the depot headquarters. The company commander, after making a personal reconnaissance of the area, selects a site suitable for clothing impregnating plant operations.

3–16. Site Selection Factors

The adaptability of a location to plant operations is a prime factor in the selection of a site. The site should be level and well drained. Other factors include nearness to railhead and road nets, adequate water supply, and sewage disposal system.

a. Whenever possible, existing buildings with the required floor space and with the required floor strength to support the heavy plant equipment should be used for plant operations. If a suitable building is not available, the company will be dependent upon engineer construction units to construct or rebuild the required facilities.

b. Accessibility to a water supply such as water mains or a river or other natural source is of paramount importance in the selection of a site. If the site is more than 120 meters from the water source, the company will be dependent upon engineer water supply units or water transport teams for the supply of water for plant operations.

3–17. Arrangement of Site

a. The company site should be arranged so that work can be efficiently performed by each plant independently of the other. The two plants should be at least 300 meters apart.

b. Improved roads within the area are required for traffic related to plant operations.

c. Buildings or other shelter for company headquarters, mess, and personnel should be conveniently near the impregnating plants.

d. Provision should be made within the plant area for covered storage for operational supplies, including imprenating materials and fuel for plant equipment.

3–18. Establishment of Impregnating Plant

Detailed information about the movement of plant and auxiliary equipment to the site, preparation of the building, plant layout plan, and installation of equipment is contained in TM 3–409.

3–19. Covered Space Requirements

a. Each clothing impregnating plant requires approximately 5,000 square feet of covered floor space. Dimensions of the required building are approximately 100 feet by 50 feet.

b. Company headquarters; platoon headquarters; and company mess, supply, and administrative functions require a total of approximately 1,900 square feet of covered space (buildings or tents) appropriately dispersed.

3–20. Water Requirements

Daily water requirements of the company total approximately 4,400 gallons, including approximately 4,000 gallons for the clothing impregnation operations of the two plants. When the plants operate under the company's secondary mission as a fixed field laundry, the water requirement is increased to that of a comparable size laundry.

3–21. Records and Reports

a. Impregnating plant operational records include a log on each batch of clothing impregnated. A suggested format for the log is shown in TM 3–409. Data are entered on the forms by the impregnating machine operator, and the completed forms are forwarded to company headquarters for retention.

b. TM 38–750 contains procedures for the preparation, maintenance, and submission of equipment records and reports pertaining to the clothing impregnating plant and other equipment of the company.

3–22. Clothing Decontamination by Laundry Process

a. When an impregnating plant is used under the company's secondary mission as a fixed field laundry, the operations include the decontamination of clothing by the laundry process. Detailed procedures for the decontamination of radioactively contaminated clothing and clothing that has been contaminated by chemical or biological agents are contained in TM 10–280.

b. Personnel handling contaminated clothing should wear the protective clothing listed in TM 10–280 and described in TM 10–277. Allowances for the protective clothing are contained in CTA 50–902. Personnel handling radioactively contaminated clothing should attach IM–93/UD radiacmeters (dosimeters) to the clothing they wear. These radiacmeters, which are authorized by the company's TOE, are used by the personnel to keep a continuing record of radiation doses received.

c. Radiac instruments and chemical agent detector kits are authorized by the company's TOE for use by personnel in checking the completeness of the decontamination of contaminated clothing and checking for contamination within the plant area.

3–23. Staff Supervision

Staff supervision of the chemical processing company's operations is normally exercised by the chemical officer of the field depot to which the company is assigned.

3–24. Communications Equipment

The company has three telephones for use by the company commander and each of the two platoon leaders. The telephones are tied into the field depot switchboard.

CHAPTER 4

CBR SUPPORT DECONTAMINATION

Section I. INTRODUCTION

4–1. General

a. CBR support decontamination, formerly known as third echelon or field decontamination, is that decontamination which is beyond the capabilities of the using (supported) unit (TM 3–220).

b. It includes the decontamination of critical in-

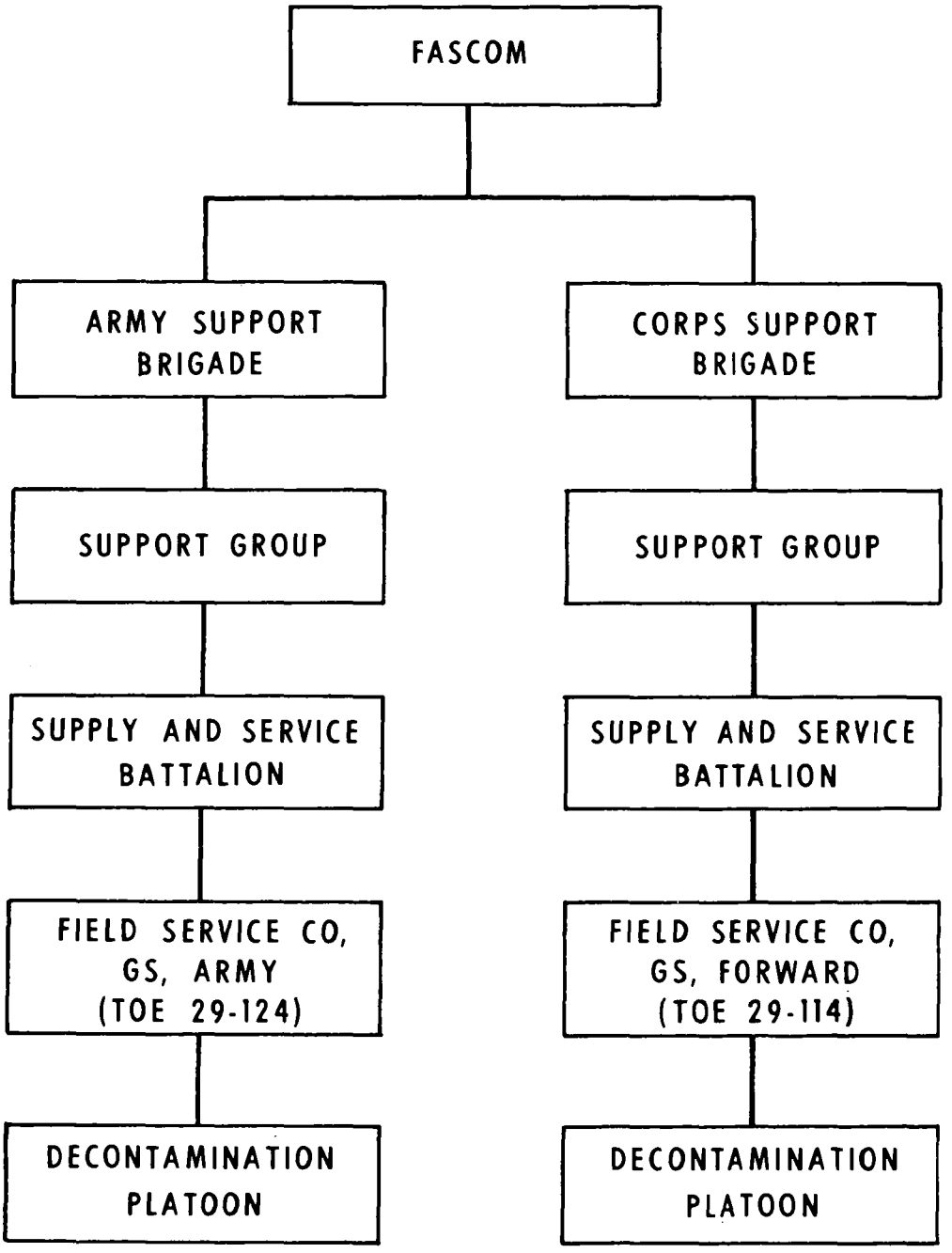


Figure 4–1. Typical organization for CBR support decontamination in support of units in a field army (schematic).

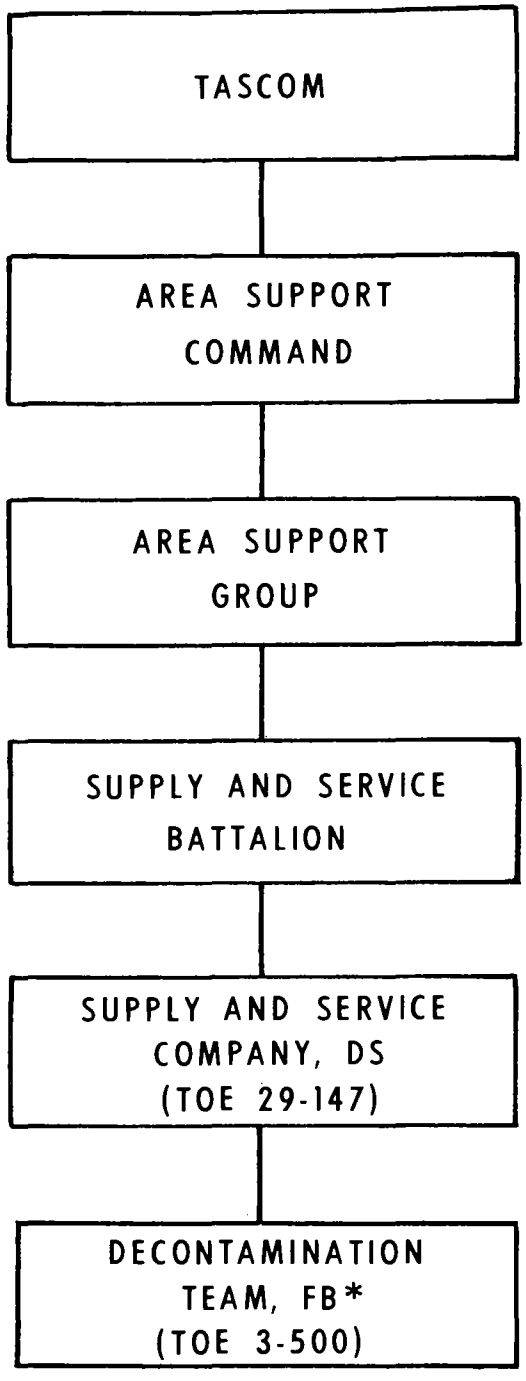


Figure 4–2. Typical organization for CBR support decontamination in support of units in a communications zone (schematic).

stallations, terrain, and materiel by use of decontaminants and the decontamination of personnel by showering at personnel decontamination stations.

c. It does not include the decontamination of terrain by the earth-removal process that is performed by engineer units with earth-moving equipment nor the decontamination of clothing by mobile laundry units or chemical processing companies by means of the laundering process (TM 10–280).

4–2. CBR Support Decontamination in a Field Army

CBR support decontamination for units in a field army is provided by the decontamination platoon of the field service company, general support (GS), army (TOE 29–124) and the decontamination platoon of the field service company, general support, forward (TOE 29–114). A typical organization for CBR support decontamination in support of units in a field army is shown schematically in figure 4–1.

a. Field Service Company, General Support, Army.

(1) This company (fig. 4–1) is assigned to the field army support command (FASCOM). It is normally attached to a supply and service battalion that is attached to a support group of the army support brigade. The company is allocated on the basis of two per field army service area.

(2) The decontamination platoon provides CBR support decontamination for units in the field army service area. It consists of a headquarters and eight sections, each of which is equipped with a 500-gallon skid-mounted power-driven decontaminating apparatus. The platoon is capable of—

(*a*) Providing CBR support decontamination of critical installations, terrain, and materiel in support of 16,000 troops.

(*b*) Operating an emergency personnel decontamination station with a capacity of 480 individuals per hour.

(*c*) Providing mobile personnel shower service.

(*d*) Providing emergency firefighting service.

(3) Detailed information pertaining to the operations of the company and the decontamination platoon is contained in FM 29–45.

b. Field Service Company, General Support, Forward.

(1) This company (fig. 4–1) is assigned to the FASCOM. It is normally attached to a supply and service battalion that is attached to a support group of the corps support brigade. The company is allocated on the basis of one per division.

(2) The decontamination platoon provides CBR support decontamination for divisions and nondivisional units in the corps area. The organization, equipment, and capabilities of the decontamination platoon are identical with those of the decontamination platoon of the field service company, general support, army.

(3) Detailed information pertaining to the operations of the company and the decontamination platoon is contained in FM 29–45.

4–3. CBR Support Decontamination in a Communications Zone

CBR support decontamination for units in the communications zone is provided by TOE 3–500 decontamination team, FB, which is attached to the direct support (DS) supply and service company (TOE 29–147). A typical organization for CBR support decontamination in support of units in a communications zone is shown schematically in figure 4–2.

a. Supply and Service Company, Direct Support. This company (fig. 4–2) is assigned to the theater army support command (TASCOM). Normally it is attached to a supply and service battalion that is attached to an area support group of the area support command. It is allocated on the basis of one company per 15,000 nondivisional troops supported. Detailed information pertaining to the operations of the company is contained in FM 29–3–1.

b. TOE 3–500 Decontamination Team, FB. This team is discussed in section II.

Section II. DECONTAMINATION TEAM, FB

4–4. Mobility

The decontamination team, FB (TOE 3–500) has 100 percent ground mobility with organic vehicles and 100 percent air transportability.

4–5. Capabilities

The FB team is capable of—

a. Providing CBR support decontamination of critical installations, terrain, and materiel in support of 16,000 troops.

b. Operating an emergency personnel decontamination station with a capacity of 480 individuals per hour.

c. Operating a vehicular equipment decontamination station.

d. Employing organic equipment to provide additional support which includes—

(1) Mobile personnel shower service.

(2) Emergency firefighting.

(3) Aircraft and ground vehicle washing service.

(4) Small-area defoliation.

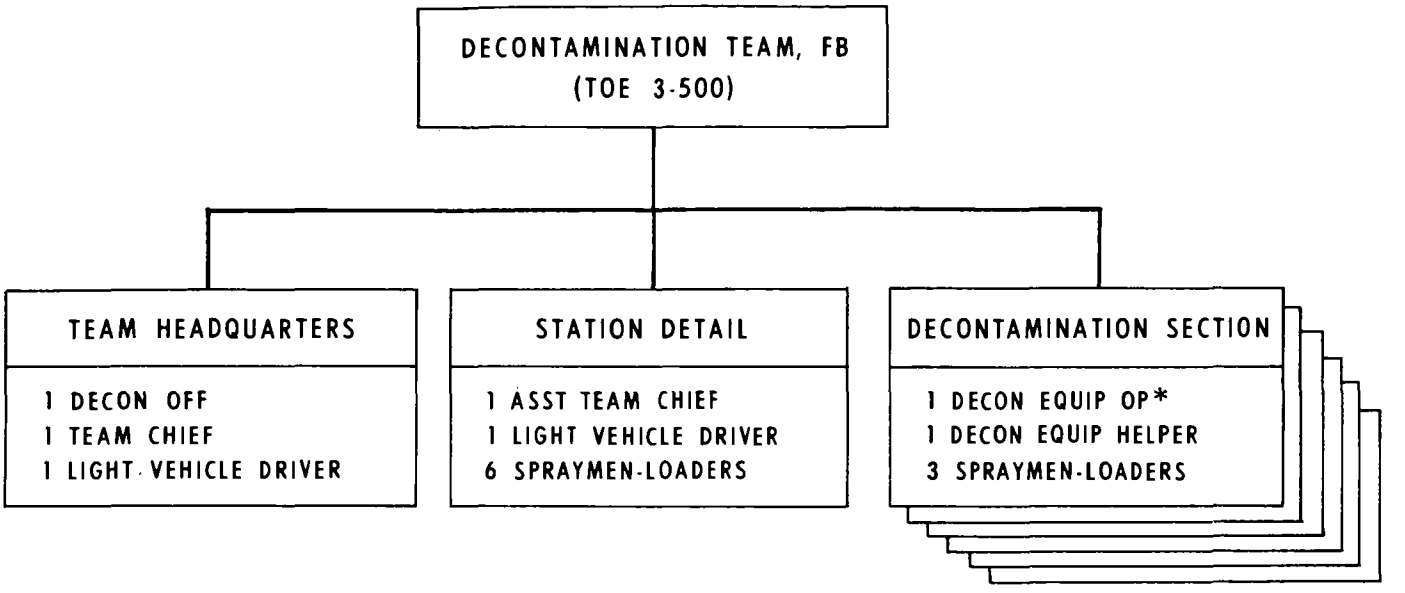
(5) Spraying of insecticides when authorized.

4–6. Mission Equipment

a. Power-Driven Decontaminating Apparatus. The FB team is equipped with six 500-gallon skid-mounted power-driven decontaminating apparatuses, each of which includes a water heater. For transportation each apparatus is loaded on a cargo truck with which the team is equipped. The apparatus is used primarily to spray decontaminants. The principal decontaminants are slurry and hot soapy water. Slurry is a mixture of water and STB decontaminating agent (bleach). Slurry and the soap solution are prepared in the tank of the apparatus. Each apparatus is operated by a five-man crew. Information pertaining to the decontaminants and decontamination methods is contained in TM 3–220. Information pertaining to the operation of the decontaminating apparatus and its water heater is contained in TM 3–4230–209–12.

b. Water Equipment. The FB team is equipped with two water pumps and auxiliary hose for the transfer of water from a water source to two 3,000-gallon fabric tanks. The tanks store water for use in decontamination.

c. Biological Decontaminating Agent Sprayers. The FB team is equipped with two types of power-driven sprayers which were designed to spray insecticides but which are used by the team to disseminate BPL biological decontaminating agent in vapor form for the biological decontamination of the interiors of buildings and other inclosed spaces. One type is skid mounted and the other pushcart mounted. Information pertaining to the use of the sprayers in decontamination operations is contained in TM 3–220. Information pertaining to the operations of the skid-mounted and pushcart-mounted sprayers is contained in TM 5–3740–200–15 and TM 5–3740–201–15, respectively.



* The decontamination equipment operator is also section chief.

Figure 4–3. Typical organization of a decontamination team, FB, for power-driven decontaminating apparatus operations.

4–7. Decontamination Supplies

Allowances for decontaminating agents used in power-driven decontaminating apparatuses and sprayers and for other expendable supplies used in decontamination operations are listed in SB 700–50.

4–8. Protective Clothing

Items of protective clothing to be worn by personnel engaged in decontamination operations are listed in TM 3–200. Detailed information pertaining to the clothing is contained in TM 10–277. Allowances for the items are listed in CTA 50–902.

4–9. Water Supply

Water supply is an essential factor in decontamination operations. Streams and rivers are the most common sources. Sea water is satisfactory for mixing with bleach. The trucks on which the decontaminating apparatus tanks are loaded may be used in transporting the water-loaded tanks from the water source to the site of the decontamination operations when the time required for transportation is only a few minutes. For longer distances the decontamination team depends on engineer water supply units or water transport teams for supplementary water support by transporting water to be pumped into the 3,000-gallon storage tanks.

4–10. Organization and Functions for Power-Driven Decontaminating Apparatus Operations

a. Organization. A typical organization of the FB team for power-driven decontaminating apparatus operations (fig. 4–3) consists of a team headquarters, a station detail, and six decontamination sections. Each section is equipped with a power-driven decontaminating apparatus.

b. Functions.

(1) Functions of team headquarters personnel include command of the team and supervision of decontamination operations.

(2) Functions of station detail personnel include operation of water pumps; erection of water storage tanks; and receipt, storage, and issue of bleach and other decontaminating materials to the decontamination sections.

(3) Functions of decontamination section personnel include operation of the power-driven decontaminating apparatus and the performing of decontamination operations.

4–11. Personnel and Vehicular Equipment Decontamination Stations

Detailed information pertaining to personnel and vehicular equipment decontamination stations that may be operated by the FB team is contained in TM 3–220.

CHAPTER 5

SUPPORT TEAMS

Section I. INTRODUCTION

5–1. General

The chemical service organization (TOE 3–500) provides cellular, specialized teams of varying sizes, functions, and capabilities for use in meeting the particular CBR support needs of the theater of operations. The team organization provides variety and flexibility to permit the most efficient use of manpower and equipment. Teams may be combined to form a composite unit or may be attached or assigned to fixed-strength TOE units or to other teams. The teams provide combat support and combat service support.

5–2. Types of Teams

The types of teams provided by TOE 3–500 are—

a. Chemical combat support.

b. Decontamination.

c. CBR element.

d. CBR agent sampling and analysis.

e. CBR reconnaissance.

f. Mechanized flamethrower.

g. CBR staff.

5–3. Capabilities

a. The capabilities of a specific team are listed in the discussion of that team. The capabilities of a composite unit of two or more teams will vary with the number and types of teams used.

b. The individuals of each team can engage in effective, coordinated defense of the team's area or installation or can contribute to the defense of the unit to which assigned or attached.

5–4. Limitations

a. The teams are dependent on other units—normally the fixed-strength unit to which the team is attached or assigned—for mess, supply, personnel, finance, medical, and chaplain services. They are also dependent on other units for organizational maintenance except that the chemical combat support team, which has a limited organizational maintenance capability, is partly dependent. Administrative support required by a composite unit is provided by a composite service organization (TOE 29–500) team.

b. The teams are not adaptable to a type B organization.

5–5. Basis of Allocation

The allocation of teams depends on the specific support requirements. Type allocations are indicated in the discussion of the individual teams.

5–6. Category

The category of each team depends upon the unit to which it is assigned or attached and the conditions under which the team will operate.

5–7. Mobility

The degree of mobility of teams using organic transportation is listed in the discussion of the individual teams. The mobility of a composite unit depends upon the mobility of the teams forming the unit.

Section II. CHEMICAL COMBAT SUPPORT TEAM, PA

5–8. Mission

The mission of the chemical combat support team, PA, is to provide various types of CBR combat support to major tactical units.

5–9. Basis of Allocation

The team is allocated on the basis of one per infantry, armored, mechanized infantry, airborne, or air cavalry division; separate brigade; armored

cavalry regiment; or similar-size major tactical unit.

5–10. Mobility

The team has 100 percent ground mobility with organic vehicles and 100 percent air transportability in Air Force medium transport aircraft. It is deployable in airmobile operations using Army aircraft.

5–11. Organizational Maintenance

The team has a limited organizational maintenance capability. It is capable of performing organizational maintenance on its vehicles and major items of mission equipment. It is dependent upon the supported unit for additional organizational maintenance support.

5–12. Operational Capabilities

The chemical combat support team is capable of performing a variety of CBR support functions. The functions include—

a. Conducting defoliation operations.

b. Preparing and emplacing flame mines, flame fougasses, and other flame field expedients.

c. Conducting tactical riot control agent operations, to include operations for tunnel clearing and denial and operations for restricting the enemy use of terrain.

d. Operating airborne personnel detectors.

e. Filling and pressurizing portable flamethrowers.

f. Preparing thickened fuel for mechanized flamethrowers.

g. Developing or evaluating CBR systems, doctrine, and equipment.

h. Assisting in the CBR training and inspection of the supported unit.

i. Providing technical advice to the supported unit.

j. Providing limited CBR support decontamination and mobile shower and firefighting services and the washing of aircraft and ground vehicles on a priority basis designated by the supported unit commander.

5–13. Operational Limitations

The team is dependent upon aviation units for aircraft support for airborne personnel detector operations, aerial tactical riot control agent operations, and aerial small-scale area defoliation operations.

5–14. Operational Organization

a. The team is structured triangularly so that essentially equal support may be provided simultaneously to each of three elements of the supported unit. For example, when the team is assigned or attached to a division, equal support may be provided simultaneously to each of the three brigades. This support encompasses four operational areas: tactical riot control agent, flame, defoliation, and personnel detector.

b. Figure 5–1 depicts a typical operational organization of a combat support team organized as a detachment with a headquarters and three operations elements, each of which consists of four operations subelements and one organizational maintenance subelement. It also lists the personnel of the headquarters and the operations subelements.

5–15. Duties and Functions

a. Headquarters Element.

(1) The CBR operations officer commands the detachment and advises the supported unit commander on the integration of CBR support.

(2) The chemical munitions development officer acts as assistant CBR operations officer and as detachment commander in the absence of the CBR operations officer. His duties include the development of chemical and flame field expedients and the field testing of new or developmental chemical and flame items of materiel.

(3) The chemical operations noncommissioned officer (NCO) is the principal enlisted assistant to the detachment commander. He assists in planning, executing, and controlling the activities of the detachment. He arranges the necessary administrative and logistical support for the detachment's activities and performs the functions normally associated with those of a first sergeant or platoon sergeant.

(4) The herbicide operations NCO, flame operations NCO, and chemical munitions NCO assist in planning and executing activities pertaining to defoliation, flame, and tactical riot control agent operations support, respectively. They also assist in materiel development and testing.

(5) Functions of other headquarters element personnel include supply and other unit administrative duties.

b. Tactical Riot Control Agent Operations Subelement. The three chemical munitions specialists employ aerial and ground tactical riot control agent munitions and dispersers in support of the supported unit's operations. They also assist the chemical munitions development officer in developing, employing, and testing new chemical items of materiel.

c. Flame Operations Subelement. The flame munitions specialist and the two flame fuel equipment operators operate the subelement's tracked vehicle-mounted flamethrower service unit. They prepare flame fuel and fill, prepare, and assist in the emplacement of flame mines, flame fougasses, and other flame field expedients. They can fill and pressurize portable flamethrowers and can fill and service mechanized flamethrowers used by the supported unit. They also assist the chemical munitions development officer in developing, employing, and testing new flame items of materiel. One of the operators drives the tracked vehicle on which the flamethrower service unit is mounted.

d. Defoliation Operations Subelement. The defoliation specialist and the four defoliation equipment operators support the small-area defoliation mission of Army aircraft organic to or operating in support of the supported unit. They also operate a 500-gallon power-driven decontaminating apparatus as a defoliant spray device in conducting small-area ground defoliation operations. Using the decontaminating apparatus, they can provide hot-water showers and firefighting services, wash vehicles and other heavy equipment, and operate personnel and vehicular equipment decontamination stations on an "as required" basis. One of the operators drives the 5-ton cargo truck on which the decontaminating apparatus is loaded.

e. Personnel Detector Operations Subelement.

(1) The three personnel detector specialists mount aerial personnel detectors on Army aircraft available to the supported unit and operate the detectors in support of the intelligence function of the supported unit. One of the specialists drives the subelement's ¼-ton truck.

(2) The personnel detector is employed to detect suspected enemy locations. Results of its use should be combined with other intelligence sources, such as agent reports, airborne radio direction finding, side-looking radar, and infrared photography. The detector can be used in support of combat operations such as airmobile assault, search and destroy, and convoy escort.

f. Organizational Maintenance Subelement. The chemical equipment repairman and the general vehicle repairman perform organizational maintenance on the major chemical items of mission equipment and the vehicles, respectively, of the four operations subelements.

5–16. Location

The detachment headquarters is normally located in close proximity to the headquarters of the unit to which it is attached or assigned.

5–17. Employment

Operations elements of the detachment may be employed throughout the zone of operations of the supported unit. Organic vehicles provide the elements with surface mobility. Operating elements depend on aircraft from sources available to the supported unit for conduct of aerial support missions.

5–18. Operational Control

When an operations element of the detachment is dispatched to a combat unit—for example, a divisional brigade—to perform support operations, it normally will be under the operational control or staff supervision of the supported unit, that is, the brigade chemical officer.

5–19. Communications

a. Radio Communication. The detachment has four AN/VRC–46 radio sets. One set is installed in the ¼-ton truck used by the detachment commander and one in each of the three tracked vehicle-mounted flamethrower service units used by the flame operations subelements. The radio sets provide the detachment commander with FM-voice communication with the supported unit command net and with the three operations elements.

b. Telephone Communication. The detachment has one TA–312/PT telephone set installed at the detachment command post. It is tied in with the wire from the switchboard of the supported unit or area communications center.

5–20. References

FM 3–10 and TC 3–16 discuss the employment of tactical riot control agents, munitions, and dispersers. TC 3–16 also discusses the employment of flame devices and portable flamethrowers; use of the tracked vehicle-mounted flamethrower service unit in servicing flamethrowers; use of the power-driven decontaminating apparatus in defolia-

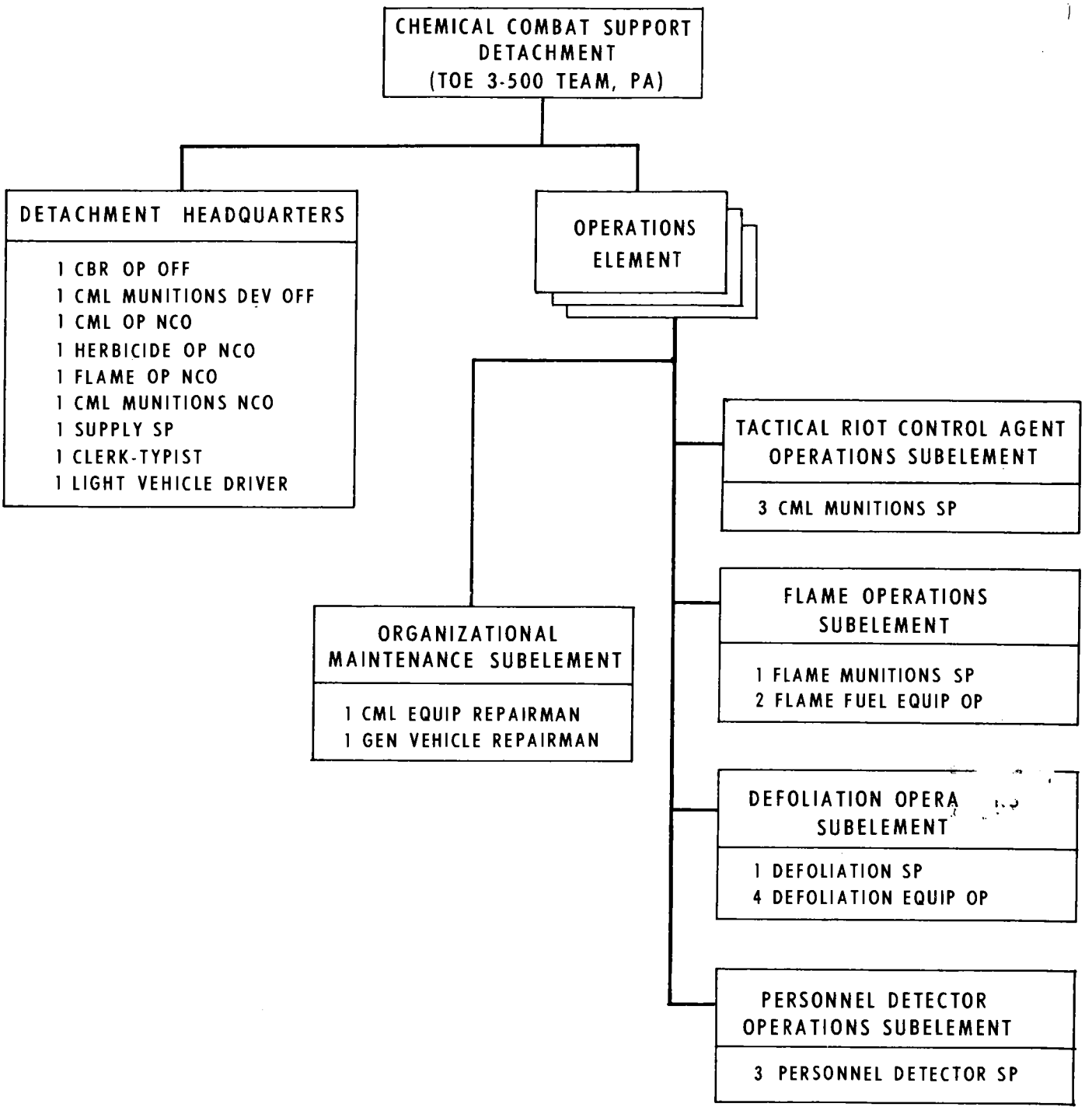


Figure 5–1. Typical operational organization of a chemical combat support detachment (TOE 3–500 team, PA).

tion operations; and operation of aircraft-mounted personnel detectors and methods for conducting personnel detector missions. For information pertaining to the operation of Army aircraft in personnel detector missions, see FM 1–100. TM 3–366 discusses the preparation of flame fuels. TM 3–1040–256–12 discusses the operation of the tracked vehicle-mounted flamethrower service unit, and TM 3–4230–209–12 discusses the operation of the power-driven decontaminating apparatus. Information concerning flamethrower servicing and pressurizing is also contained in the technical manual pertaining to the specific type of flamethrower.

Section III. OTHER SUPPORT TEAMS

5–21. Decontamination Team, FB

The decontamination team, FB, is discussed in chapter 4.

5–22. CBR Element (CBRE) Teams, JA and JB

a. Mission and Capabilities. The mission of the CBR element teams, JA and JB, is to provide CBR element operational support to various headquarters, including those of major tactical and combat service support units. The JA and JB teams are capable of providing this support for one 12-hour shift and for two 12-hour shifts, respectively.

b. Assignment.

(1) The JA team may be assigned to the headquarters of an organization that requires the operation of a CBR element on a one-shift (12-hour) basis or that requires augmentation of the CBR element of the tactical operations center to provide a two-shift (24-hour) operational capability for the CBRE.

(2) The JB team may be assigned to the headquarters of an organization that does not have an organic CBR element but that requires operation of a CBR element on a two-shift (24-hour) basis.

c. Mobility. The JA and JB teams have 100 percent ground mobility with organic vehicles and 100 percent air transportability.

d. Composition.

★(1) The JA team is composed of one officer who is chief of a 12-hour duty shift and four enlisted personnel consisting of one CBRE sergeant, two CBRE specialists, and one clerk-typist.

★(2) The JB team is equivalent to two JA teams and is composed of two officers, each of whom is chief of one of the two 12-hour shifts, and eight enlisted personnel consisting of two CBRE sergeants, four CBRE specialists, and two clerk-typists.

★*e. Duties of Personnel.* The duties of the personnel of the JA and JB teams are listed in appendix B and in FM 3–12.

5–23. CBR Agent Sampling and Analysis Team, KA

a. Mission. The mission of the KA team is to perform CBR agent field sampling and analyzing operations.

b. Capabilities. By operating the ABC–M19 CBR agent sampling and analyzing kit, the KA team is capable of—

(1) Sampling known and unknown chemical agents in the form of solids, liquids, aerosols, smokes, and vapors from water, air, and soil.

(2) Identifying known chemical agents.

(3) Identifying functional components of unknown chemicals and indicating by that means the type of "family" of the unknown chemical agents.

(4) Sampling biological agents from water and soil.

(5) Sampling radiological agents from surfaces and soil.

(6) Collecting and forwarding samples of radiological agents and unknown chemical agents to a general chemical laboratory for identification.

(7) Collecting and forwarding samples of biological agents to a medical laboratory for identification.

★*c. Basis of Allocation.* The KA team is allocated on the basis of one or more per division or equivalent or higher headquarters as required.

d. Mobility. The KA team has 100 percent ground mobility with organic vehicles and 100 percent air transportability.

e. Mission Equipment. The principal item of mission equipment is M19 CBR agent sampling and analyzing kit. The kit essentially is a portable field chemical laboratory. A trained technician is required to operate the kit and perform tests. An organic chemist is required to evaluate the results of the tests. Operating instructions are contained in TM 3–6665–250–10/1, and sampling and analyzing procedures are contained in TM 3–6665–205–10/2.

f. Composition. The KA team consists of one officer who is an organic chemist and one enlisted chemical laboratory specialist who is the kit operator.

g. Duties of Personnel.

(1) The organic chemist supervises the work of the kit operator, evaluates and interprets the results of the tests, and informs the chemical officer of the unit to which the team is attached as to the results of the tests.

(2) The kit operator takes samples, performs tests, and as an additional duty drives the team's vehicle.

h. Operations.

(1) The KA team operates under the staff supervision of the officer of the division or other unit to which it is attached.

(2) The team conducts chemical agent tests not only on samples that it collects but also on white-band tube samples collected and forwarded to it by units equipped with ABC–M18-series chemical agent detector kits or with M34 CBR agent sampling kits. If the results of the tests indicate the submitted samples represent unknown chemical agents, the KA team notifies the collecting unit so that it can take fresh samples at the earliest opportunity. The collecting unit forwards the new samples directly to the general chemical laboratory for analysis.

(3) The team is capable of conducting sampling and analyzing operations at night by use of an ultraviolet lamp and kit components color coded and marked with fluorescent paint.

(4) Sampling components of the kit will function at temperatures as low as —25° F. The analyzing components will function at temperatures ranging from 32° F. to 115° F.

(5) FM 21–40 contains additional information pertaining to the operations of the team and its relationship with the theater CBR agent detection and identification system.

i. Communications Equipment. Communications equipment consists of one AN/VRC–46 radio set mounted in the team's ¾-ton cargo truck.

5–24. CBR Reconnaissance LA Team and LB Team (SF)

a. Mission. The mission of the CBR reconnaissance LA team is to perform CBR reconnaissance. The special forces (SF) team, LB, also has this mission and additionally has the mission to provide CBR technical intelligence.

b. Capabilities.

(1) The LA and LB teams are capable of performing CBR reconnaissance of the site of a nuclear, chemical, or biological attack and providing essential reconnaissance data.

(2) The LB team is additionally capable of photographing and reporting on elements of CBR technical intelligence and expediting the flow of captured materiel.

c. Basis of Allocation.

★(1) The LA team is allocated on the basis of one or more per armored cavalry regiment or equivalent or higher headquarters as required.

(2) The LB team is allocated on the basis of one or more per special forces unit as required.

d. Mobility.

(1) The LA team has 100 percent ground mobility with organic vehicles and 100 percent air transportability.

(2) As the LB team has no organic ground vehicle, it is dependent upon the capture or confiscation of vehicles within a denied area during limited or general war and requires vehicle augmentation during internal defense operations. It has 100 percent air transportability and can be landed by parachute.

(3) When the site of a nuclear, chemical, or biological attack is inaccessible to ground vehicles or when speed in obtaining information is essential, the LA and LB teams are dependent upon aviation units to provide air transportation.

e. Mission Equipment. The principal mission equipment of the LA and LB teams includes the M19 CBR agent sampling and analyzing kit, M18-series chemical agent detector kit, and IM–174A/PD radiacmeter. The LB team is additionally equipped with a still picture camera set.

f. Composition.

(1) The LA team consists of one CBR reconnaissance officer and four enlisted personnel including a CBR reconnaissance sergeant, a CBR identification kit operator, a reconnaissance sergeant, and a CBR reconnaissance specialist.

(2) The LB team consists of one officer and five enlisted personnel. The composition is the same as that of the LA team except that the LB team includes one additional enlisted member who is a CBR technical intelligence specialist.

g. Duties of Personnel.

(1) The CBR reconnaissance officer—an organic chemist—commands the team. His duties include—

(*a*) Directing the operations of the team.

(*b*) Evaluating and interpreting the results of tests made by use of the M19 CBR agent sampling and analyzing kit.

(*c*) Reporting the results of the team's operations to appropriate headquarters by the fastest means available.

(2) Duties of the CBR reconnaissance sergeant include—

(*a*) Assisting the team commander in team administrative matters.

(*b*) Supervising chemical agent detection, CB agent sampling, and radiological monitoring and survey operations.

(*c*) Computing the decay of radioactive contamination to determine the time extent of the contamination hazard.

(*d*) Supervising the marking of contaminated areas.

(*e*) Preparing map overlays showing contaminated areas.

(3) The CBR identification kit operator—a chemical laboratory specialist—operates the M19 CBR agent sampling and analyzing kit.

(4) Duties of the reconnaissance sergeant include—

(*a*) Performing reconnaissance to determine the condition of routes of communications, terrain features, structures, facilities, obstructions, and barriers.

(*b*) Preparing rough maps and field sketches to depict conditions in the area.

(5) Duties of the CBR reconnaissance specialist include—

(*a*) Conducting chemical agent detection and CB agent sampling operations.

(*b*) Conducting radiological monitoring and survey operations.

(*c*) Marking contaminated areas.

(*d*) Driving the team's ¾-ton cargo truck.

(6) Duties of the CBR technical intelligence specialist include the photographing of captured CBR supplies and equipment for intelligence purposes.

h. Reconnaissance Functions.

(1) Reconnaissance functions of LA and LB teams in event of a nuclear attack include—

(*a*) Estimating the relative yield and height of burst.

(*b*) Determining the effects on units and installations in the vicinity of the nuclear burst.

(*c*) Detecting contamination in the area and taking samples of radioactive material.

(*d*) Conducting radiological surveys.

(*e*) Marking contaminated areas.

(*f*) Locating obstacles to maneuver and estimating their effectiveness and difficulty of removal.

(2) Reconnaissance functions of LA and LB teams in event of chemical and biological attacks include—

(*a*) Conducting chemical agent detection operations.

(*b*) Collecting samples, testing for known chemical agents by use of the M19 CBR agent sampling and analyzing kit, and evaluating and interpreting the results of the tests.

(*c*) Collecting samples of unknown or unidentifiable chemical agents for forwarding to the general chemical laboratory for identification.

(*d*) Collecting samples of biological agents for forwarding to medical laboratories for identification.

(*e*) Estimating the decontamination effort required.

(*f*) Marking contaminated areas.

(*g*) Determining the effects of the attacks on units and installations in the target areas.

i. Employment.

(1) The LA and LB teams may be deployed to the site of a nuclear, chemical, or biological attack when essential data pertaining to the attack are not available through normal channels of the NBC attack reporting and data collection system. The operations of the teams supplement this system which is described in FM 21–40 and FM 3–12.

(2) Since the LA and LB teams have little capability for evaluating the collected reconnaissance information, they are employed most effectively when receiving instructions from and reporting to a CBR element of a tactical operations center or other operations center.

(3) The LA team may also be employed as the CBR portion of control and assessment teams (CAT). The reconnaissance reports of LA teams may serve as an aid to commanders in determining the requirements for CAT. FM 61–100 covers the organization and operations of CAT.

j. Communications Equipment. The LA team is equipped with one AN/VRC–46 radio set mounted in the team's ¾-ton truck. The LB team is equipped with one AN/URC–10 radio set.

5–25. Mechanized Flamethrower Teams, NA and NB

a. Mission. The mission of the NA and NB mechanized flamethrower teams is to provide mechanized flame combat support.

b. Capabilities.

(1) The NA team is capable of providing mechanized flamethrower combat support to a maneuvering force of battalion or equivalent size. The NB team is capable of providing this support to an infantry, mechanized infantry, armored, airborne, or airmobile division.

(2) By employing organic equipment on a priority basis, as established by the commander of the supported unit, the NA and NB teams are capable of providing additional support to include—

(*a*) Preparing flame fuel for and filling and pressurizing portable flamethrowers.

(*b*) Preparing flame fuel for and filling flame mines, flame fougasses, and other flame field expedients.

(*c*) Decontaminating vital areas by burning.

(*d*) Destroying enemy supplies and materiel by burning.

(*e*) Assisting in clearing minefields by burning off vegetation.

c. Operational Limitation. The NA and NB teams are dependent upon the supported unit for logistical support, to include gasoline resupply.

d. Basis of Allocation.

(1) The NA team is allocated on the basis of one per separate brigade when not provided mechanized flame support from other sources. It may augment the capabilities of the NB team or the chemical mechanized flame company on an "as required" basis.

(2) The NB team is allocated on the basis of one per division. It may augment the capabilities of the chemical mechanized flame company on an "as required" basis.

e. Mobility. The NA and NB teams have 100 percent ground mobility with organic vehicles and 100 percent air transportability in Air Force heavy transport aircraft.

f. Mission Equipment. The principal items of mission equipment of the NA and NB teams are the self-propelled flamethrower, which consists of a tracked carrier on which a mechanized flamethrower is mounted; and the flamethrower service unit, either truck-mounted or tracked vehicle-mounted. The teams are also equipped with the trailer-mounted 600-gallon gasoline tank. The NB team is additionally equipped with a 1,200-gallon gasoline tank truck.

g. Operational Organization.

(1) The NA team is section size and consists of a headquarters, three flamethrower crews, and one flamethrower service unit crew. Figure 5–2 depicts a typical operational organization and lists the personnel.

(2) The NB team is platoon size and may be organized into a headquarters and three flame sections, with each section consisting of a section leader, three flamethrower crews, and one flame-

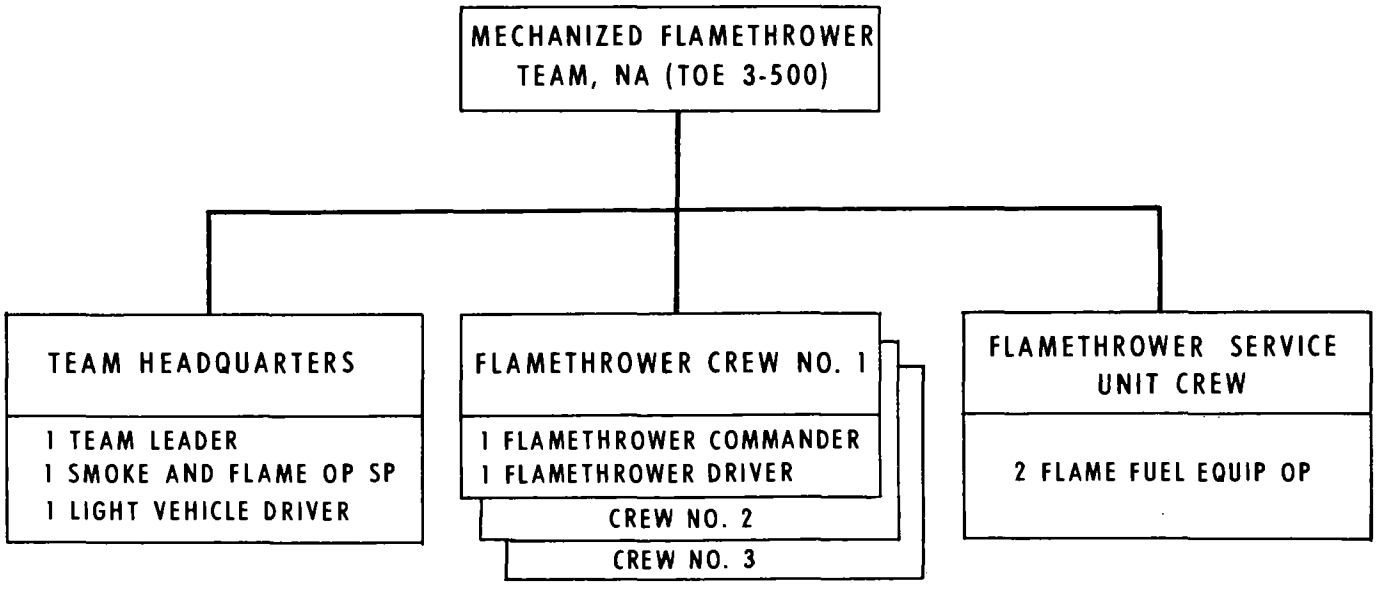


Figure 5–2. Typical operational organization of a mechanized flamethrower team, NA (TOE 3–500).

thrower service unit crew. The three-section organization permits the platoon to tactically support three maneuver elements of the supported unit, with three flamethrowers committed to each supported element. Figure 5–3 depicts a typical operational organization and lists the personnel.

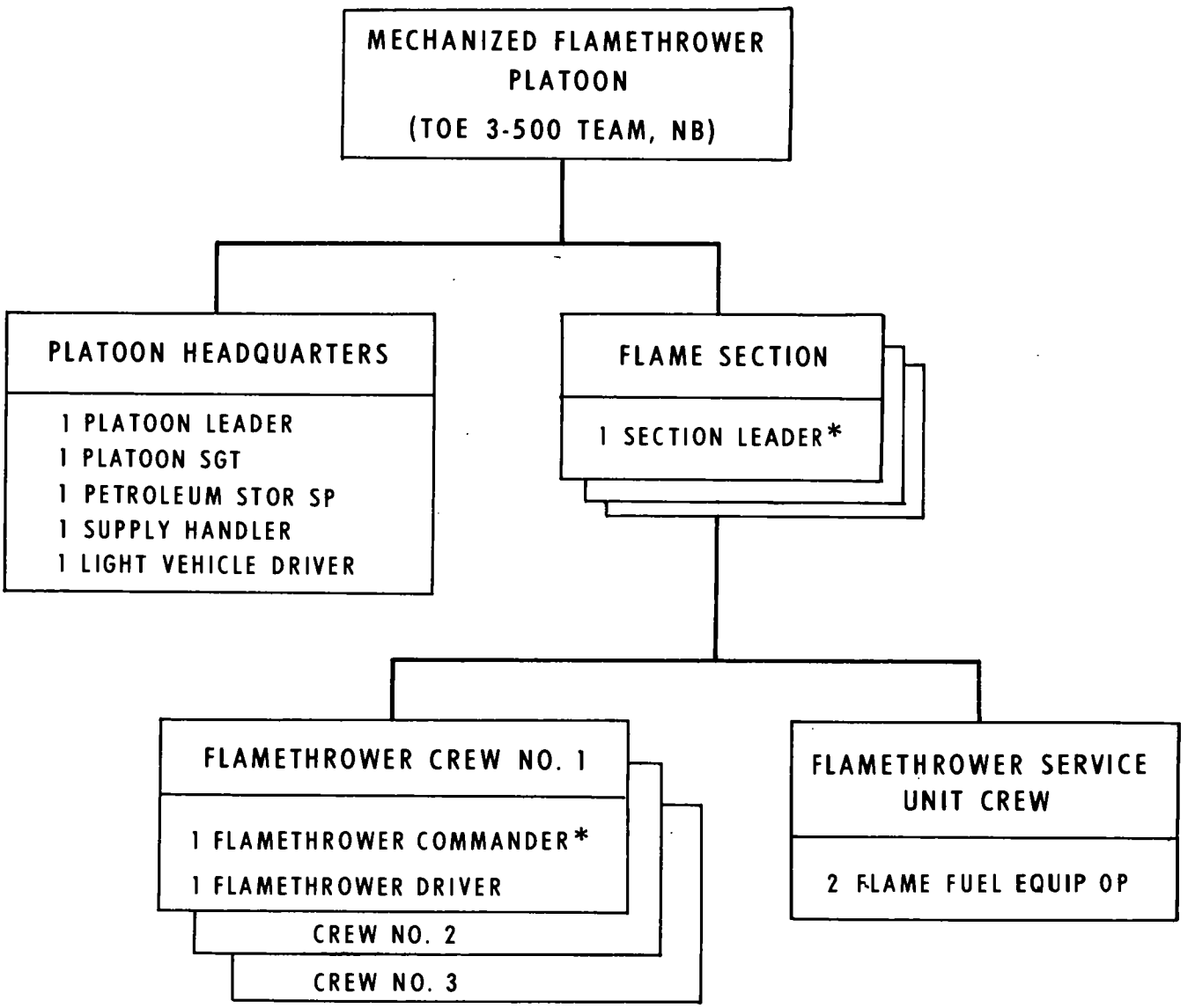
h. Duties of Personnel.

(1) *NA team.*

(*a*) *Team headquarters personnel.* Duties include command; supervision of team operations; maintaining liaison with the supported unit; and coordinating with other units the mess, supply, maintenance and other logistical support on which the team is dependent.

(*b*) *Flamethrower crew.* Duties include operation of the flamethrower's flame gun and radio and the tracked vehicle on which the flamethrower is mounted.

(*c*) *Flamethrower service unit crew.* Duties include operation of the flamethrower service unit and the vehicle on which the service unit is



*The flame section leader is also commander of flamethrower crew No. 1.

Figure 5–3. Typical operational organization of a mechanized flamethrower platoon (TOE 3–500 team, NB).

mounted; preparation of flame fuel; charging and pressurizing mechanized and portable flamethrowers; and filling flame mines, flame fougasses, and other flame field expedients.

(2) *NB platoon.*

(*a*) *Platoon headquarters personnel.* Duties include command; supervision of platoon operations; maintaining liaison with the supported unit; operation of a 1,200-gallon gasoline tank truck and delivery of gasoline from bulk distribution points to the flamethrower service units and to other vehicles of the platoon; and other supply duties.

(*b*) *Flame section leader.* The flame section leader commands and supervises the operations of the flame section. He is also the commander of the section's No. 1 flamethrower crew.

(*c*) *Flamethrower crew.* The duties of the flamethrower crew of the NB team are substantially the same as those of the NA team.

(*d*) *Flamethrower service unit crew.* The duties of the flamethrower service unit crew of the NB team are substantially the same as those of the NA team.

i. Communications.

(1) *Telephone.*

(*a*) The NA team is not equipped with a telephone.

(*b*) The NB team is equipped with one TA–312/PT telephone set and three-fourths of a mile of cable for tying in with either the supported unit or the area signal system.

(2) *Radio.* The NA and NB teams use FM-voice radios to provide communication for command and control of the teams' flamethrowers during combat operations and for communication with the supported unit.

(*a*) The NA team is equipped with four AN/VRC–53 radio sets. One set is mounted in the team leader's ¼-ton truck and one in each of three flamethrower carriers.

(*b*) The NB team is equipped with one AN/VRC–47 radio set mounted in the platoon leader's ¼-ton truck and ten AN/VRC–53 radio sets with one mounted in the platoon sergeant's ¼-ton truck and one in each of the nine flamethrower carriers.

(3) *Visual.* The mechanized flamethrowers of the NA and NB teams are equipped with visual communications means such as pyrotechnics, signaling panels, and flags sets.

j. Operations. FM 20–33 covers the tactical employment of mechanized flamethrowers, the servicing of mechanized and portable flamethrowers, and the preparation and employment of flame field expedients. TM 9–2300–244–10¾ and TM 3–1040–209–12 cover the operation of the flamethrower carrier and the mechanized flamethrower, respectively. TM 3–1040–219–12 and TM 3–1040–256–12 cover the operations of the truck-mounted and tracked vehicle-mounted flamethrower service units, respectively. TM 3–366 covers the preparation of flame fuels.

5–26. CBR Staff (SF) Team, OA

a. Mission and Capability. The mission of the OA team is to provide CBR staffing. The team is capable of providing CBR staff services to the headquarters of a contingency or independent-type force which is not authorized organic chemical personnel.

b. Basis of Allocation. The team is allocated on the basis of one per headquarters of a group, brigade, or equivalent size unit assigned a CBR mission. For special forces organizations the headquarters would be the special forces operational base (SFOB), which is the controlling headquarters of deployed special forces (SF) detachments.

c. Mobility. The team has 100 percent ground mobility with organic vehicles. It has 100 percent air transportability and can be landed by parachute.

d. Functions. The team provides the supported unit headquarters with CBR technical advice and with advisory and planning services.

e. Composition. The team is composed of a chemical officer and two enlisted personnel consisting of a chemical staff sergeant and a clerk-typist.

f. Duties of Personnel.

(1) The chemical officer has overall command and control of the team. His duties include—

(*a*) Providing advice on CBR defense and on CBR protective measures.

(*b*) Preparing and supervising the CBR training program.

(*c*) Appraising the status of the supported unit's CBR training.

(*d*) Planning and supervising chemical agent detection and radiological monitoring and survey operations.

(2) The chemical staff sergeant is the princi-

pal enlisted assistant to the chemical officer. His duties include—

(*a*) Assisting the chemical officer in the performance of his duties.

(*b*) Preparing, collecting, and distributing material and data pertaining to CBR training.

(*c*) Keeping records pertaining to the status of the CBR training of the supported unit.

(3) In addition to his typing and clerical duties, the clerk-typist drives the team's ¼-ton truck.

CHAPTER 6

CBR TECHNICAL INTELLIGENCE

6–1. General

Chemical, biological, and radiological (CBR) technical intelligence is an integral part of the total military intelligence effort and is essential to military operations. The impact that enemy chemical, biological, or radiological operations will have on friendly forces makes timely technical information essential. Requirements for obtaining CBR technical intelligence generally fall into two functional categories: the collection effort and the analysis and evaluation effort.

a. The Collection Effort. The collection of CBR technical information is, for the most part, dependent on the effectiveness of the overall intelligence collection plan, using all available sources of information. On-the-spot preliminary evaluation and dissemination of significant information may be performed by technical intelligence collection personnel when the situation warrants, but final detailed analysis will normally be accomplished by technical intelligence analysis and evaluation personnel. Before the advent of chemical, biological, or radiological operations, the collection effort should be directed twoard determining the enemy level of training; the enemy potential for waging CBR operations; the enemy capability to defend against chemical and nuclear operations; the effectiveness of enemy offensive and defensive equipment; the probability or possibility of enemy chemical, biological, or radiological operations; and the magnitude and location of these operations. Once chemical, biological, or radiological operations have started, priority in the collection effort shifts to identification of agents employed; information on new weapons and agents; enemy defensive capabilities and protective measures; size and location of stockpiles; potential targets for engagement; and tactics, techniques, and procedures used.

b. The Analysis and Evaluation Effort. The use of chemical and biological weapons introduces new factors into technical intelligence operations. The most critical function of the technical analyst lies in analyzing and evaluating technical intelligence concerning the technical characteristics and detection of, unique modifications to, and effectiveness of enemy chemical and biological weapons with a view toward the rapid development of effective countermeasures. Liaison with the theater general chemical laboratory, with army medical laboratories, and with staff chemical officers is essential for the exchange of intelligence information.

6–2. Objectives

The objectives of CBR technical intelligence are—

a. The collection, examination, evaluation, identification, and dissemination of information on equipment, materiel, and documents pertaining to radiological operations and to chemical and biological operations under conditions of nuclear or nonnuclear warfare.

b. The collection of samples of chemical, biological, and radiological agents employed against friendly forces; the identification of chemical agents or transmittal of samples to a supporting general chemical laboratory for chemical and toxicological analysis; the transmittal of biological samples to a supporting medical laboratory for identification; and the collection and forwarding of radiological samples to a supporting general chemical laboratory for determination of radioisotopic composition.

c. The collection, evaluation, and dissemination of information pertaining to the enemy's capability of and techniques and procedures for the following: decontamination; individual and collective protection; CBR agent detection and identification systems; warning of chemical, biological, or nuclear attack; impregnation and reimpregnation of clothing; field laboratory services; fallout predictions; and radiological monitoring and survey operations.

d. The collection and dissemination of information on the enemy's capability to conduct tactical operations in a chemical, biological, or nuclear environment.

e. The collection and dissemination of information on enemy chemical and biological installations and stockpiles and on the enemy's capability for chemical and biological production.

f. Assistance in developing field countermeasures against chemical or biological operations under conditions of nuclear or nonnuclear warfare and against radiological operations.

6–3. Collection Agencies

a. General. Any individual or any combat, combat support, or combat service support unit may serve as a means for the collection of information for CBR technical intelligence. The operations of selected agencies that are capable of collecting information for technical intelligence, including CBR technical intelligence, are discussed in FM 30–16.

b. CBR Technical Intelligence Collection Team, LK.

(1) The CBR technical intelligence collection team, LK, which is a military intelligence organization (TOE 30–600) team, has the capabilities to—

(*a*) Identify known chemical agents.

(*b*) Collect samples of biological and radiological agents and unknown chemical agents for forwarding to appropriate laboratories for analysis and identification.

(*c*) Submit through intelligence channels preliminary reports on captured CBR materiel, personnel, documents, and installations.

(*d*) Prepare items of technical intelligence value for evacuation to the CBR technical intelligence team, LL, for evaluation.

(2) The team may be used to provide a technical intelligence collection capability within the field army. It is allocated on the basis of one or more, as required, per military intelligence detachment, company, battalion, or group.

(3) The team consists of a CBR intelligence officer—a Chemical Corps officer who is qualified as an inorganic chemist and also qualified in technical intelligence—and four enlisted personnel. The enlisted personnel consist of a chief analyst who is qualified as a chemical staff specialist and also qualified in technical intelligence; a CBR identification kit operator—qualified as a chemical laboratory specialist and also qualified in technical intelligence—who operates an ABC-M19 CBR agent sampling and analyzing kit; a clerk-typist; and a still photographer who has an additional duty of driving the team's truck.

(4) The operations of technical intelligence collection teams are covered in FM 30–16.

c. CBR Reconnaissance (SF) Team, LB. This team is a chemical service organization (TOE 3–500) team and has a mission that includes the provision of CBR technical intelligence. This team is discussed in paragraph 5–24.

6–4. Analysis and Evaluation Agencies

a. Military Intelligence Company, Technical Intelligence. The functionalized military intelligence company, technical intelligence (TOE 30–34) is the basic military intelligence unit of the field army. It has an analysis and evaluation platoon whose personnel include Chemical Corps officer and enlisted personnel. FM 30–16 covers the organization and operations of the platoon and the company, and the CBR technical intelligence analysis and evaluation functions of the chemical personnel.

b. CBR Technical Intelligence Team, LL.

(1) The CBR technical intelligence team, LL, which is a military intelligence organization (TOE 30–600) team, has the capabilities to—

(*a*) Provide technical evaluation of captured CBR equipment, personnel, and documents.

(*b*) Prepare reports and supervise the evaluation of technically significant captured materiel.

(*c*) Assist in the location and identification of enemy CBR installations.

(*d*) Prepare instructions for friendly troops in the handling, operations, and maintenance of captured materiel.

(2) The team is allocated on the basis of one or more, as required, per military intelligence company, battalion, or group.

(3) The team consists of a CBR intelligence officer—a Chemical Corps officer qualified as a chemical staff specialist and also qualified in technical intelligence—who commands the team; two assistant CBR intelligence officers, one qualified as a chemical engineer and the other as a chemical munitions development officer and both qualified in technical intelligence; and seven enlisted personnel. The enlisted personnel consist of four analysts qualified as chemical staff specialists and also qualified in technical intelligence; and a clerk-typist, a draftsman, and a still photographer each of whom has the additional duty of driving the team's trucks.

(4) The operations of technical intelligence teams are covered in FM 30–16.

c. General Chemical Laboratory. The general chemical laboratory, which is discussed in chapter 2, has as a major function the field analysis and evaluation of technical information pertaining to the enemy's state of preparedness for CBR operations and protection.

6–5. Capabilities of Chemical Personnel

Chemical personnel in technical intelligence units are capable of providing the following assistance:

a. Examining, evaluating, and identifying captured CBR materiel.

b. Examining, evaluating, and identifying, when possible, equipment related to CBR operations.

c. Preparing and forwarding samples of biological agents to medical laboratory facilities for identification.

d. Preparing and forwarding samples of chemical and radiological agents to the general chemical laboratory.

e. Providing technical assistance to staffs at army and corps levels on CBR matters.

f. Maintaining liaison with the theater general chemical laboratory.

g. Preparing intelligence reports on CBR matters and estimates of enemy capabilities and intentions for employing CBR agents.

h. Analyzing and identifying enemy-delivered chemical agents within the limitations of the ABC-M19 CBR agent sampling and analyzing kit.

i. Providing technical assistance in the interrogation of prisoners of war on CBR matters.

6–6. Relationship with CBR Agent Detection and Identification System

The operations of the CBR technical intelligence collection team, LK; CBR technical intelligence team, LL; military intelligence company, technical intelligence; CBR reconnaissance teams, LA and LB; and the general chemical laboratory are related to the theater CBR agent detection and identification system that is described and graphically depicted in FM 21–40. This system is based on the capabilities of a unit's agent detection and identification equipment.

CHAPTER 7

SUPPLY, MAINTENANCE, AND AMMUNITION SERVICE

Section I. SUPPLY

7–1. CBR Supplies

CBR supplies fall into four of the ten classes of supply which are defined in FM 100–10. The four classes are II, V. VII, and IX. An example of CBR supplies included in each of the four classes is listed below.

a. Protective masks: class II.

b. Chemical ammunition: class V.

c. Power-driven decontaminating apparatuses: class VII.

d. Repair parts for mechanical smoke generators: class IX.

7–2. Classes II and VII Supply

a. DS Supply. Direct support (DS) supply of classes II and VII CBR supplies is provided nondivisional units in the theater of operations by the DS supply and service company (TOE 29–147). Details pertaining to DS supply and to the operations of the company are contained in FM 29–3–1.

b. GS Supply. For purposes of general support (GS) supply in the field army, classes II and VII supplies are grouped as general supplies and heavy materiel supplies. Examples of CBR supplies grouped as general supplies are protective masks and chemical agent detector kits. Examples of CBR supplies grouped as heavy materiel supplies are power-driven decontaminating apparatuses and vehicle-mounted flamethrower service units. GS supply of general and heavy materiel supplies is provided by the general support general supply company and the general support heavy materiel supply company, respectively. Details pertaining to GS supply in the field army and to the operation of the GS supply companies are contained in FM 29–45–1 (Test).

c. Supply in Divisions and Separate Brigades. Classes II and VII CBR supplies are supplied to units in divisions and separate brigades through distribution points operated by division and separate brigade supply units, respectively. Details pertaining to supply in divisions and separate brigades and to the operations of the supply units are contained in FM 29–50.

7–3. Class IX (Repair Parts) Supply

a. DS Supply. Direct support supply of class IX supplies, including repair parts for chemical equipment, is provided by DS maintenance units rather than through supply channels.

(1) Details pertaining to DS supply of repair parts to nondivisional units are contained in FM 29–22.

(2) Details pertaining to DS repair parts supply in divisions and separate brigades are contained in FM 29–30.

b. GS Supply. General support supply of class IX supplies, including repair parts for chemical equipment, in the field army is provided by the GS repair parts company. Details pertaining to the GS supply of repair parts and operations of the company are contained in FM 29–45–1 (Test).

7–4. Class V Supply

The supply of class V supplies, including chemical ammunition, in the theater is a function of ammunition service and is provided by ammunition units. Details pertaining to class V supply and to the operations of the ammunition units are contained in FM 9–6.

Section II. MAINTENANCE

7–5. Chemical Maintenance Support

★Chemical maintenance support formerly provided by chemical maintenance units is provided by functionalized direct and general support maintenance units. These units have chemical equipment repairmen and specialists assigned to

perform the maintenance. Items of chemical equipment for which chemical equipment repairmen are authorized are listed in AR 570–2. Detailed instructions for the maintenance or an item of chemical equipment are contained in the 3-series technical manual pertaining to that item.

7–6. Maintenance Support System

a. Information pertaining to the principles, functions, and management of the maintenance support system in theaters of operation is contained in FM 29–20.

b. Information pertaining to the nondivisional direct support and general support maintenance of chemical equipment and direct support chemical equipment repair parts supply provided within the field army area and communications zone by maintenance units is contained in FM 29–22.

c. Information pertaining to the direct support maintenance of chemical equipment and direct support chemical equipment repair parts supply provided within divisions and separate brigades by maintenance units is contained in FM 29–30.

7–7. DS/GS Chemical Equipment Repair Teams

Chemical equipment repair teams EP, EQ, and ER (TOE 29–610) provide DS and/or GS maintenance of chemical equipment. The teams are 100 percent mobile and are assigned to division, corps, army, communications zone, or theater for attachment as required. They are capable of performing inspection, testing, and DS/GS repair. The 5-member EP team, 7-member EQ team, and 10-member ER team are composed of chemical equipment repairmen. In each team one chemical equipment repairman serves as team chief.

7–8. Collection and Classification Company (TOE 29–139)

Collection and classification companies are attached to the GS maintenance battalions that provide GS maintenance in the field army area and in the communications zone.

a. The company establishes and operates a collection and classification point for the receipt, inspection, segregation, disassembly, preservation, and disposition of serviceable, unserviceable, or abandoned U.S. materiel including chemical equipment. It also assists the technical intelligence effort in the processing and disposition of captured items of foreign materiel except explosive items.

b. Company personnel include a chemical equipment inspector and a chemical equipment repairman.

c. Information pertaining to the organization and operations of the company is contained in FM 29–22.

Section III. AMMUNITION SERVICE

7–9. Ammunition Grouping

Ammunition is divided into two groups—conventional and special.

a. Conventional ammunition includes all ammunition items that do not require extraordinary control, handling, or security.

b. Special ammunition items are those that require extraordinary control, handling, or security.

c. Certain chemical ammunition items are grouped as conventional ammunition, and certain chemical ammunition items are grouped as special ammunition.

(1) Chemical ammunition items grouped as coventional ammunition include ammunition filled with smoke, incendiary, and riot control agents.

(2) Chemical ammunition items grouped as special ammunition include those filled with lethal and incapacitating chemical agents.

d. Bursters and igniters for chemical ammunition and peptizers and thickeners for flame fuels are grouped as conventional ammunition.

7–10. Ammunition Supply, Distribution, and Maintenance

Details pertaining to the supply, distribution, and maintenance of conventional and special ammunition are contained in FM 9–6.

7–11. Ammunition Service for Chemical Ammunition

a. Ammunition service for chemical ammunition includes the supply functions of distribution and maintenance while in storage. Specific functions

include receipt, issue, storage, surveillance, inspection, renovation, shipment, and disposal.

b. Thorough plans must be prepared for chemical agent detection (surveillance) and decontamination, technical escort, and other safety measures when shipping, storing, handling, and disposing of chemical ammunition.

c. Plans for the handling, storage, and shipment of chemical ammunition must include measures for the safety of all personnel and communities that may be exposed to accidental hazards (AR 50–21) and for the safety and physical security of chemical ammunition (AR 11–17 and AR 190–3).

d. Technical escort of shipments and inspection, demilitarization, and deactivation of chemical ammunition are accomplished by the munition safety control detachment GC, TOE 9–520.

e. Detailed information pertaining to ammunition service for chemical ammunition is contained in FM 9–6.

7–12. Explosive Ordnance Disposal Service

Explosive ordnance disposal (EOD) service is provided by EOD detachments (TOE 9–520). It is designed to detect, identify, render safe, recover, evaluate, and dispose of United States and foreign explosive ordnance—including chemical, and nuclear weapons—which has been fired, dropped, or placed in such a manner as to constitute a hazard to personnel, installations, materiel, and operations.

a. EOD service includes the disposal of explosive items rendered hazardous through damage or deterioration, when the local commander determines the disposal of these items to be beyond the capabilities of personnel normally assigned the responsibility for routine destruction. EOD units also assist in the destruction of ammunition to prevent capture by the enemy and in the destruction of captured ammunition.

b. Details pertaining to EOD service and to the operations of EOD units are contained in FM 31–45 and FM 9–15.

CHAPTER 8

STAFF SERVICES

Section I. INTRODUCTION

★8–1. General

CBR staff services are provided commanders at all levels to assist them in assuring that their units and commands attain an operational and material readiness and an operational capability to carry out their missions during conditions involving employment of friendly and enemy chemical and nuclear weapons and enemy biological weapons.

8–2. Scope

The scope of the CBR staff services required by a commander varies with the level and size of the unit or command. For example, the CBR staff services requirements of an army commander are more numerous and more complex than those of a battalion commander. The scope of the services also varies with the type of unit. For example, the scope of the staff services requirements of the commander of a tactical unit would normally include the area of offensive employment of chemical weapons, whereas the requirements of the commander of a nontactical unit would normally not include this area.

Section II. FUNCTIONS AND RESPONSIBILITIES

8–3. General

Functions and responsibilities pertaining to CBR staff services for selected units and commands are discussed in this section.

8–4. Company/Battery/Troop

CBR staff services are provided the commander of a company, battery, or troop by designated unit personnel. They are a school-trained CBR officer, a school-trained CBR noncommissioned officer (NCO), and an enlisted alternate who are appointed on orders by the unit commander to serve on an additional duty basis. Functions of company/battery/troop CBR personnel are listed in FM 21–40.

8–5. Battalion/Squadron

The duties of a battalion chemical NCO—a chemical staff specialist—are listed in FM 7–20. The duties are applicable to a squadron chemical NCO.

8–6. Brigade/Regiment

The duties of a brigade chemical officer—a Chemical Corps officer—are listed in FM 17–1. The duties are applicable to a regiment chemical officer.

8–7. Division, Corps, and Field Army

a. At the division level of command, the CBR staff functions are performed by the division chemical officer—a Chemical Corps officer—who heads the chemical section of the division special staff.

b. As there is no chemical special staff section at corps and field army levels of command, CBR staff functions are performed by Chemical Corps officers who are integrated into appropriate general staff sections, that is, assistant chief of staff (ACofS), G2; ACofS, G3; and ACofS, G4.

c. Chemical officer duties and responsibilities at division, corps, and field army levels are listed in FM 101–5.

8–8. Nuclear Weapons Effects Officer

At corps headquarters and at field army headquarters, there is a nuclear weapons effects officer —a Chemical Corps officer—who is assigned to the ACofS, G3 section. His duties include the provision of technical advice and assistance on the nonmedical aspects of the effects of nuclear weapons.

8–9. CBR Staff Functions in Major Combat Service Support Field Command Headquarters

The responsibilities for CBR staff functions in two major combat service support field command headquarters, that is, theater army support command (TASCOM) and field army support command (FASCOM), are discussed in this paragraph. These functions are performed by Chemical Corps officer and enlisted personnel assigned to the appropriate ACofS section. The duties performed by the Chemical Corp personnel include the provision of assistance in—

a. Compiling the phased chemical troop basis.

b. Determing requirements for chemical units.

c. Recommending priorities for chemical units.

d. Recommending priorities for the allocation of chemical equipment within the command.

e. Preparing plans, policies, and programs pertaining to chemical operations.

f. Planning and supervising the CBR training of headquarters and subordinate units.

g. Planning for the protection of personnel, facilities, and materiel of the command from enemy CB and nuclear attacks.

h. Maintaining the radiation dose status chart of subordinate and attached units.

i. Preparing broad guidance and policies for the maintenance of chemical equipment.

j. Reviewing, analyzing, and evaluating chemical materiel status reports.

k. Establishing maintenance standards for the inspection of chemical materiel and disseminating the data to subordinate units.

l. Reviewing priority schedules for the reconditioning of chemical equipment.

m. Establishing and disseminating policies for the collection and evacuation of captured CBR materiel.

n. Preparing plans and policies pertaining to the collection, processing, and dissemination of information of CBR intelligence value.

o. Establishing policies and providing broad guidance for the CBR portion of the area damage control activities of the command.

8–10. CBR Staff Functions in TASCOM and FASCOM Units

CBR staff functions in TASCOM and FASCOM units are performed by Chemical Corps officer and enlisted personnel assigned to appropriate staff sections. The functions are specifically oriented toward the provision of technical advice and assistance in areas that include the—

a. Storage and distribution of chemical materiel.

b. Maintenance and modification of chemical materiel.

c. Technical escort of hazardous chemical ammunition and radioactive waste.

d. Recovery, evacuation, salvage, and disposal of chemical materiel.

e. Surveillance, renovation, and disposal of chemical ammunition.

f. Management of chemical materiel.

g. CBR decontamination.

h. Protective clothing impregnation or reimpregnation.

i. CBR aspects of area damage control.

j. CBR technical intelligence.

CHAPTER 9

PLANNING CBR COMBAT SERVICE SUPPORT

Section I. PLANNING PHASES AND FACTORS

9–1. General

★*a.* CBR combat service support planning is accomplished concurrently with the planning for the combat operation. The closest coordination between combat and logistical planning is required because of the major effect of logistical support on the ability of a command to carry out combat operations. A service support plan *cannot* be formulated without coordination with all other arms and services. Consideration must be given to the impact that friendly employment of chemical weapons and enemy employment of chemical, biological, and nuclear weapons may have on CBR combat service support. These operations may increase requirements in service support personnel and materiel. Enemy capabilities for employment of CB and nuclear weapons must be constantly evaluated.

b. Anticipating demands is a prime function of every staff officer. The CBR plan outlines methods for fulfillment of these demands. There is no prescribed form, but a plan will normally consist of sections dealing with the significant elements of CBR combat service support, such as—

(1) Requirements for and employment of chemical personnel and units.

(2) Chemical maintenance support.

(3) CBR class II, VII, and IX supply.

(4) Chemical class V supply.

(5) Reclamation of captured CBR materiel.

(6) Evacuation and disposal of CBR materiel.

(7) Specialized services.

c. To achieve the basic objective of support for tactical operations, any logistical plan should be devised with the following elements in mind:

(1) Efficient use of transportation.

(2) Reduction in the multiple handling of supplies.

(3) Reduction in order and shipping times.

★(4) Elimination, or reduction to a minimum, of requirements that do not contribute directly to the progress of combat operations.

(5) Maximum and efficient use of manpower.

(6) Economical use of supplies and equipment.

(7) Reduction in items that are nice to have but are not essential.

(8) Simplification of work, to include the use of the latest mechanical methods for handling supplies and the use of automatic electronic devices for supply control.

(9) Establishment and maintenance of minimum supply levels.

(10) Establishment of alternate means to provide support so as to obtain flexibility.

(11) Provisions for mobility of installations.

(12) Establishment and coordination of rear area protection (rear area defense and area damage control).

(13) Provisions for dispersion of units and installations.

★*d.* Inherent in any plan is the requirement for methods of avoiding excessive losses, particularly those that may be caused by enemy CB and nuclear weapons. Consideration must be given to—

(1) Establishment of multiple, properly dispersed facilities and installations.

(2) Use of cover, concealment, camouflage, and revetments.

(3) Use of covered storage to the extent feasible to avoid contamination of materiel.

(4) Duplication of essential stock control records.

(5) Need for alternate communication facilities.

(6) Provision for plans and organization for area damage control.

(7) Provision for alternate facilities, installa-

tions, and transportation means to insure continuous support for the combat forces.

(8) Protection for indigenous labor.

(9) Continuous evaluation of the enemy capability.

9–2. Responsibility for Planning

Each echelon is responsible for making plans that are based on the plans of the next higher echelon. Subordinate units must be furnished with data that will affect their planning as soon as these data are developed. Planning, however, must proceed even when complete instructions from higher headquarters have not been furnished. The importance of continuous planning cannot be overemphasized. Planning involves the use of known information supplemented by assumptions where facts are not available. Chemical planners must be alert to detect or anticipate changing conditions and to modify plans to meet each change.

9–3. Planning Considerations

★The first element of chemical planning is to determine and evaluate the CBR service support mission. This part of the plan involves determining the significant elements of CBR service support that will be required. A troop list can then be developed, and the requirements for CBR supplies may be calculated; thus the basis is formed for a chemical support organization and logistical plan.

a. The following general steps are essential to the accomplishment of sound troop requirements planning:

(1) Determination of the functions or tasks to be performed.

(2) Determination of the number of troops to be supported.

(3) Selection of type of operating unit, with capability required.

(4) Calculation of number of operating units required.

(5) Provisions for command and control.

b. Many factors influence the number and type of chemical troops required to support any given operation. Principal factors are—

(1) Number and type of troops to be supported, their mission, and the extent of CBR combat services support to be provided them.

(2) Climate and terrain.

(3) Size of the geographical area of operations.

(4) Attitude, availability, and capabilities of local civilians and prisoners of war.

(5) Local resources.

(6) Capabilities of chemical and multifunctional units.

(7) Enemy capabilities.

(8) CBR situation.

c. The task of determining supply requirements is basically one of forecasting the demand for each item required by all support forces in sufficient time to insure the arrival of the item at the time and place it is needed. Supply requirements are classified as follows, and are discussed in more detail in FM 100–10:

(1) Initial supply requirements to provide for the initial issue of supplies or to complete shortages in the initial issue.

(2) Replacement and consumption requirements to keep the initial equipment up to authorized levels and to replenish supplies that may be consumed or expanded by using units or destroyed by enemy action.

(3) Reserve requirements to establish or replenish an approved reserve.

(4) Project requirements to provide supplies not authorized by established allowances, but approved for a special operation or purpose to include supplies to meet civilian needs.

9–4. Planning Phases

There are three phases in planning: estimation, calculation, and modification.

a. Phase I Planning—Estimation.

(1) The estimation phase is the first step in developing an initial chemical troop list and in developing CBR supply requirements. Available data will probably be limited and will likely consist only of the total number of divisions to be employed in the operation.

(2) Chemical troop requirement calculations are based on the total troop strength and the anticipated theater organization. If only the number of divisions is known, the total number of troops can be estimated by application of the division slice data found in FM 101–10–1. The division slice is used only in the estimation phase for large forces, after which it should be discarded.

(3) Unit capabilities used in all the estimations should be verified by reference to the appropriate TOE.

(4) The amount of CBR supplies may be ini-

tially estimated by use of the ton-per-man-per-day data contained in FM 101–10–1. The factors in FM 101–10–1 do not include initial equipment of troop units, but they do include tonnages for projected equipment and similar supplies (other than civilian or other relief supplies) that are required to support troops. Buildup of theater levels can also be determined by use of these data. The chemical planner may have to make an assumption concerning the status of equipment in the force in order to estimate the initial supply requirements. It will normally be assumed that the force will have all its initial equipment. The chemical planner must balance the estimated supply requirements with the available lift tonnages.

b. Phase II Planning—Calculation.

(1) This phase begins when estimates are received from all arms and services in the form of initial tentative troop lists. The initial troop lists developed by all the arms and services must be accomplished by close collaboration, since any arbitrary unilateral change will affect the entire structure. For instance, the TASCOM or FASCOM ACofS, supply, must be aware of the total troop requirements if he is expected to provide protective clothing and other CBR defense materiel for the entire force. Similarly, all staffs must be made aware of any changes in requirements.

★(2) After the tentative troop list has been developed, the division slice and other factors suitable only for initial estimations are discarded, and refined lists of equipment and personnel are developed. (Using the troop list, personnel strength and total equipment equirements can be calculated by use of appropriate equipment lists, tables of allowance, and special mission equipment lists.) Chemical staff officers should carefully scrutinize the troop lists of the other arms and services to determine their impact on chemical operations. The threat of enemy CBR operations will also mean that the chemical officer will be required to furnish the other arms and services with information concerning its impact on their support. The troop list should be accurate and should reflect the actual troop requirements necessary to perform the CBR combat service support mission.

★(3) During this phase, revised troop and equipment lists are distributed to planning staffs of all arms and services, and concurrent adjustments are made in each list. Each planner should review the list and decide whether the next revision will increase or decrease troop spaces. This information is furnished all planners so that each planner will be aware of changes that are to be applied. Close coordination must be maintained during this phase so that adjustments in other troop lists are properly reflectted in chemical combat service support or multifunctionally oriented troop lists. Normally several revisions are made to bring the troop list into proper balance.

(4) The tonnages of CBR supplies must be translated into quantities of CBR supplies by item. Consideration will be given to the phase deployment of troops, strategic and tactical plans of the supported forces, enemy capabilities affecting supply requirements, amount and status of equipment, replacement factors and consumption rates, capability and dependability of the transportation system, available lift tonnages, buildup time, project requirements, reserve requirements, supply levels, requirements of other services for CBR items, and climate and terrain in the area of operations.

c. Phase III Planning—Modification.

(1) The consolidate troop list produced in phase II should provide a balanced force, each element of which is capable of performing its mission without augmentation. Phase III continues as long as the operation continues. It involves continuous refinement of troop and equipment lists after consideration of such matters as distribution of troops by zone and area, locations of facilities, and preplanned loading lists. Plans for changes, substitution, or elimination of authorized equipment will be made at this time.

(2) If the planner can tentatively make the distribution of troops and determine the location of the depots and other major installations in phases I and II, the final determination is simplified. Each planner will become increasingly aware of the deployment of the troops of other arms and services throughout the theater; therefore, he must adjust his own distribution to meet the probable load.

(3) During this phase, changes to all plans are made as dictated by policy, command direction, changes in the tactical situation, or conditions peculiar to the theater of operations.

(4) Substitution of indigenous labor for military personnel should be made at this stage. At the same time, lists of CBR equipment to be issued for the use of the indigenous labor forces should be prepared. The substitution of indigenous labor for military personnel will throw the troop list out of balance, and several successive revisions such as those made in phase II may be

required to restore it to balance. The CBR combat service support troop list will be affected considerably by the change in military strength.

9-5. Planning Factors

A planning factor is one of the tools used in planning. Factors may be represented by a fixed quantity, such as the quantity of troops in a task force. Other factors represent a ratio based on experience, such as the replacement factor (percentage of end items that must be replaced periodically.) These factors are useful in planning even though the numerical values of these factors will probably change after actual experience data have been gained from an operation. FM 3-8, FM 101-10-1, SB 3-34, and SB 710-1 contain valuable data for the staff officer. The key planning factors are—

a. Troop Basis. A troop basis is a planning document that sets forth a major command's troop requirements by numbers and types of units, designations, organizations, strengths, locations, assignments, grades, and branches within a personnel ceiling prescribed by higher headquarters. An approved troop basis constitutes a major commander's authorization for personnel and equipment (TOE and TD units).

b. Troop List. A troop list is any list of military units or individuals. Generally, a troop list will contain the designations of all the units in the theater of operations or all the units served by the theater's machine records unit. This list may include units located in the area but not assigned to the command, such as attached allied units. An approved troop list does not necessarily constitute a troop basis.

c. Troop Availability. The determination of troop availability is based on several factors. These factors are the troop requirement of the command, the overall troop ceiling set by higher headquarters, and the availability of specific type units. Troop requirements are coordinated to keep them within the overall ceiling and yet have a balanced force that can perform its mission.

d. Replacement Factor.

(1) Replacement factors for selected items of chemical materiel are listed in SB 710-1. FM 3-8 contains replacement factors and consumption rates for other items of chemical materiel. If the equipment density is known for any force, replacement factors can be used to compute the normal replacement requirements to maintain the initial equipment density.

(2) Replacement factors are reviewed periodically and are revised as necessary to reflect the latest experience data, with consideration given to new concepts of operation, maintenance, and technological advancements. They are used primarily in planning and are not used when adequate demand experience has been generated.

e. Consumption Rate. A consumption rate is the average quantity of an item expended or consumed during a given time interval expressed in quantities per applicable basis (rounds per weapon per day or pounds per man per day). It usually pertains to expendable items. Consumption rates are also reviewed periodically and are used primarily in planning requirements. They also are not used when adequate demand experience has been generated.

f. Operational Readiness Float Stockage Factor. An operational readiness float consists of the major items of equipment authorized for stockage by units having a maintenance mission; these items are required for issue as replacements for unserviceable, economically repairable equipment to meet operational commitments, provided the equipment cannot be repaired in time to meet operational requirements. Stockage factors for items of chemical equipment are listed in SB 3-34.

g. Storage and Site Locations. Optimum storage area requirements for supported military operations are outlined in FM 101-10-1.

9-6. Phasing Chemical Units Into a Theater of Operations

a. Staff Coordination. Full cooperation between the chemical officers of the supporting and supported forces is essential. The support plan must be compatible with the planned buildup of the communications zone. The phasing of troops must be timely and in proper sequence, consistent with the progress of the expansion of the theater of operations.

b. Control. Until the army area has been expanded sufficiently to permit establishment of a communications zone, the logistical organization is under control of the field army commander. Chemical units destined for ultimate assignment in the communications zone will be attached to the logistical organization and will be under the operational control of the field army commander. Sites must be obtained for chemical units so that they will be located properly for future support of the theater of operations.

Section II. PLANNING FOR USE OF INDIGENOUS LABOR

9–7. General

Indigenous labor is an important source of manpower for the augmentation of certain units. Indigenous labor should be used whenever possible and to the maximum profitable degree. The amount and type of labor that will be available must be considered in estimating service troop requirements. Auxiliary labor sources are prisoners of war, troops of allied nations, and local skilled and semiskilled civilians. Generally, this type of labor cannot be used for handling or processing special ammunition or classified materiel.

9–8. Availability and Utilization

a. Employment of Indigenous Labor. Indigenous skilled labor of an industrial nation can be used to a great advantage in most service support units. Indigenous labor is made available by coordination with the ACofS, G1, personnel.

b. Hazardous Employment. Where there is a danger of enemy action, civilian labor is not dependable. This—as well as the usual troubles resulting from language differences, local labor laws, union rules, and national customs—causes production difficulties. In addition, where large groups of indigenous labor are employed, careful consideration must be given to the extra surveillance required and to the security aspects of the operation. Continuous supervision is necessary to counteract or preclude slowdowns or acts of sabotage of any nature.

c. Equipment for Indigenous Labor. Indigenous labor must be provided the tools and equipment necessary to accomplish the task required. Commanders are required to provide the labor force with individual equipment, such as protective masks and protective clothing, and with shelter when these personnel are in a CBR environment.

d. Availability Estimates. During the planning stage, intelligence agencies can furnish estimates of the amount, types, quality, and attitude of indigenous labor that may be available in specific areas. After territory is occupied, more precise availability estimates may be obtained.

9–9. Procurement

Procurement of indigenous labor is normally conducted under the supervision of the G1 of each command. In the communications zone, indigenous labor is usually obtained from local governmental agencies such as labor offices established by civil affairs personnel. The responsibilities of agencies regarding procurement of labor and establishment of standing operating procedures concerning the employment of indigenous labor are contained in FM 41–5. The ACofS, G5, civil-military operations, maintains close coordination with the G1 and the ACofS, G4, logistics, when recruiting and using indigenous labor.

★Section III. IMPACT OF CHEMICAL AND ENEMY BIOLOGICAL AND NUCLEAR WEAPON EMPLOYMENT

9–10. General

Planners must be aware of the impact of chemical and enemy biological and nuclear weapon employment on logistic support functions and must anticipate an additional load on the combat service support system.

9–11. Areas for Consideration

a. Supply.

(1) Friendly chemical operations increase requirements for chemical ammunition. The nature of the agents in chemical ammunition requires separate storage of the ammunition in depots to simplify surveillance and to limit hazards from faulty or damaged ammunition. Field filling of chemical ammunition requires special equipment to transfer the agents from bulk shipping containers to the ammunition. This operation requires specially trained personnel and strict safety and surety controls. The disposal of faulty or damaged ammunition and supplies contaminated beyond reasonable decontamination limits presents special combat service support problems.

(2) Enemy CB and nuclear weapon employment increases the requirement for resupply or replacement of CBR defensive equipment and supplies such as individual and unit protective equipment, detection and warning equipment, decontamination equipment and supplies, and clothing impregnation supplies.

(3) Dispersion, cover, and the use of mobile supply points may reduce the vulnerability of supply operations.

b. Maintenance. Maintenance problems increase when equipment is contaminated. Equipment from contaminated areas must be decontaminated before maintenance and repair are conducted. Maintenance units may require separate sites within the maintenance area for storage and decontamination of equipment before maintenance is conducted. A delay in decontamination may necessitate a large number of replacement items in the supply system. Requirements for covered maintenance shop space and storage space will increase. This increase will be necessary in order to provide protection for maintenance personnel and protection of supplies against contamination. A policy of conducting decontamination of equipment by using units is necessary to insure placing only essential demands on the maintenance support system.

c. Medical Evacuation and Hospitalization.

(1) *Planning.* Medical planners developing hospitalization programs must consider the possibility of increased patient admission, variations in patient accumulation, need for greater dispersion, and requirement for specialized treatment facilities as a result of enemy CBR operations. These programs will require provision of adequate reserve of medical supplies and equipment, the capability of rapid relocation of medical units, the efficient sorting of patients by appropriate medical personnel, and the capability of rapid evacuation of patients to supporting medical facilities. The consumption rate of medical supplies, including drugs and biologicals, will increase; some of these supplies have a characteristic short shelf life or require special storage facilities. Command and control procedures must provide rapid response to sustained increases and recurring patient peakloads. Because CB weapons can cause considerable casualties resulting in sizable patient loads in relatively short periods, medical planners must emphasize the training of each individual in personal protective measures and first aid. By taking appropriate, immediate action to the effects of CB agents, military personnel will measurably improve their survival and lessen the patient workload of medical treatment facilities.

(2) *Protection.* Area coverage capabilities of the enemy CB weapons may be such that the effects may encompass medical installations, even though not a primary target. Therefore, in extensive enemy CB weapon employment, medical planners must provide collective protection for treatment facilities to safegurd patients and medical personnel from attack.

d. Transportation.

(1) The employment of chemial ammunition introduces special safety, security, and handling problems. Common to any mode of transportation selected for a hazardous-type chemical shipment is the requirement for an escort of qualified and equipped personnel to assure a high degree of safety and security for the shipment. AR 740–32 covers responsibilities for technical escort of chemical ammunition.

(2) When chemical agents contaminate large areas, traffic may require rerouting along uncontaminated routes.

e. Personnel. Specialists must be made available to the commander to assist in CBR defense planning and to provide support for friendly chemical operations. In addition, enemy CB employment not only may inflict large numbers of casualties on friendly forces but also may require them to operate in a toxic environment, thereby reducing their efficiency. Personnel plans should provide for rapid replacement of large numbers of casualties and for accelerated rotation of personnel or units whose efficiency has been reduced by prolonged operations in a toxic environment.

f. Labor. The work efficiency of all categories of labor is lower in a CB contaminated area than in a noncontaminated area. Civilian labor will likely be reluctant to work in contaminated areas or in the vicinity of potential CB targets. The Geneva Convention prohibits employing prisoners of war in contaminated areas unless the prisoners volunteer. Commanders can reduce labor problems associated with enemy CB operations by conducting adequate individual CB defense training and providing the means for individual protection against CB attack.

g. Civil Affairs. Enemy CB and nuclear operations substantially affect civil affairs activities. Requirements for CB and nuclear defense and area damage control measures and medical facilities for cities and towns increase. These requirements include shelters and protective equipment, surveys to detect and mark radiologically contaminated areas, the evacuation of vital facilities, the distribution of food and medical supplies for disaster relief, and the prevention of disease.

APPENDIX A

REFERENCES

A–1. Army Regulations (AR)

1–35	Basic Policies and Principles for Interservice and Interdepartmental Logistic Support.
11–17	Chemical and Biological Weapons Surety Program.
50–2	Nuclear Weapon Accident and Incident Control (NAIC).
50–21	Chemical and Biological Surety Program—Chemical-Biological Accident and Incident Control (CBAIC).
190–3	Physical Security Standards for Storage of Chemical and Biological Agents and Munitions.
310–25	Dictionary of United States Army Terms.
310–50	Authorized Abbreviation and Brevity Codes.
380–series	Security.
570–2	Organization and Equipment Authorization Tables—Personnel.
740–32	Responsibilities for Technical Escorts of Chemical, Biological, and Etiological Agents.

A–2. Field Manuals (FM)

1–100	Army Aviation Utilization.
3–8	Chemical Reference Handbook.
★3–10	Employment of Chemical and Biological Agents.
3–12	Operational Aspects of Radiological Defense.
3–50	Chemical Smoke Generator Units and Smoke Operations.
7–20	The Infantry Battalions.
9–6	Ammunition Service in the Theater of Operations.
9–15	Explosive Ordnance Disposal Unit Operations.
17–1	Armor Operations.
20–33	Combat Flame Operations.
21–40	Chemical, Biological, Radiological, and Nuclear Defense.
★29–3–1	Direct Support Supply and Service in the Theaters of Operations.
29–20	Maintenance Management in Theaters of Operations.
29–22	Maintenance Battalion and Company Operations (Nondivisional).
29–30	Maintenance Battalion and Company Operations in Divisions and Separate Brigades.
29–45	General Support Supply and Service in the Field Army.
29–45–1 (Test)	General Support Supply and Service in the Field Army.
29–50	Supply and Services in Divisions and Separate Brigades.
30–16	Technical Intelligence.
31–16	Counterguerrilla Operations.
31–45	Explosive Ordnance Disposal Service.
★31–85	Rear Area Protection (RAP) Operations.
(C) 32–5	Signal Security (SIGSEC) (U).
41–5	Joint Manual For Civil Affairs.
61–100	The Division.

100–10	Combat Service Support.
101–5	Staff Officers' Field Manual: Staff Organization and Procedure.
101–10–1	Staff Officers' Field Manual: Organizational, Technical, and Logistical Data (Unclassified Data).
★(S) 101–10–3	Staff Officers' Field Manual: Organizational, Technical, and Logistical Data; Classified Data (U).

A–3. Technical Manuals (TM)

3–210	Fallout Prediction.
3–220	Chemical, Biological, and Radiological (CBR) Decontamination.
3–250	Storage, Shipment, Handling, and Disposal of Chemical Agents and Hazardous Chemicals.
3–366	Flame Fuels.
3–409	Impregnating Plant, Clothing, M2A1.
3–1040–209–12	Organizational Maintenance Manual: Flamethrower, Mechanized, Main Armament, M10–8.
3–1040–219–12	Operator's and Organizational Maintenance Manual: Service Unit, Flame Thrower, Truck-Mounted, M4A2 (IR) (Davey) FSN 1040–740–1152 (Ingersoll-Rand) FSN 1040–740–1150.
3–1040–256–12	Operator and Organizational Maintenance Manual: Service Unit, Flamethrower, Tracked-Vehicle Mounted, XM45E1.
3–4230–209–12	Operator and Organizational Maintenance Manual: Decontaminating Apparatus, Power-Driven, Skid-Mounted, Multipurpose, Nonintegral. 500-gallon, M12A1.
3–6665–205–10/1	Operator's Manual: Sampling and Analyzing Kit, CBR Agent, M19.
(C) 3–6665–205–10/2	Operator's Manual: Sampling and Analyzing Procedures, Sampling and Analyzing Kit, CBR Agent, M19 (U).
5–3740–200–15	Operator, Organizational, Direct Support, General Support, and Depot Maintenance Manual: Sprayer, Insecticide, Skid-Mounted: Gasoline Driven; 40 Gal per Hour; Fog (Curtis Model CFR–40000) FSN 3740–790–6188 (Leco Model CM–40) FSN 3740–955–9341.
5–3740–201–15	Operator, Organizational, Field and Depot Maintenance Manual: Sprayer, Insecticide, Pushcart-mounted: Mist Type, Gasoline Driven, 30 gph, 25 psi (Curtis Automotive Devices Model CAD 11080–1–A) FSN 3740–542–4866.
9–2300–224–10/3/4	Operator's Manual for Flame Thrower, Self-Propelled M132 (2350–987–8900) and M132A1 (2350–056–6809).
10–277	Protective Clothing, Chemical Operations.
10–280	Field Laundry, Bath and Clothing Exchange Operations.
38–750	The Army Maintenance Management System (TAMMS).
750–5–15	Army Equipment Data Sheet, Chemical Weapons and Defense Equipment.

A–4. Department of the Army Pamphlets (DA Pam)

310–1	Index of Administrative Publications.
310–3	Index of Doctrinal, Training, and Organizational Publications.
310–4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (types 7, 8, and 9) Supply Bulletins, and Lubrication Orders.

A–5. Tables of Organization and Equipment (TOE)

3–77	Chemical Processing Company.
3–97	General Chemical Laboratory.
3–500	Chemical Service Organization.

8–650	Medical Laboratory.
9–520	Explosive Ordnance Disposal Detachments.
10–437	Laundry and Renovation Company, General Support.
12–67	Personnel Service Company.
29–114	Field Service Company, General Support, Forward.
29–124	Field Service Company, General Support, Army.
29–139	Collection and Classification Company.
29–147	Supply and Service Company, Direct Support.
★29–408	Support Center Rear Area Operations.
29–500	Composite Service Organization.
29–512	Headquarters and Headquarters Company, Field Depot.
29–610	Mechanical Direct Support/General Support Maintenance Teams.
30–34	Military Intelligence Company, Technical Intelligence.
30–600	Military Intelligence Organization.

A–6. Miscellaneous

CTA 50–902	Clothing and Equipment (Mobilization).
SB 3–34	Maintenance Float CBR Equipment.
(C) SB 38–26	Ammunition Supply Rates (U).
SB 700–50	Expendable Items (Except: Medical, Class V, Repair Parts, and Heraldic Items).
SB 710–1	Supply Control Replacement Factors for Army Material PEMA.
TC 3–16	Employment of Riot Control Agents, Flame, Smoke, Antiplant Agents, and Personnel Detectors in Counterguerrilla Operations.

★APPENDIX B

ORGANIZATION AND OPERATIONS OF CBR ELEMENT AND CBR CENTER

Section I. ORGANIZATION AND FUNCTIONS OF THE CBRE OF A TOC

B–1. General

A chemical, biological, and radiological element (CBRE) is organized as an element of a tactical operations center (TOC) when authorized by the commander. Major units that have TOC's are division, corps, and field army. Personnel for CBRE operations either are organic to the unit or are provided by TOE 3–500 CBRE teams, JA, attached or assigned to the unit.

B–2. Scope of Activities

CBRE activities are concerned with friendly employment of chemical munitions and with fallout resulting from friendly nuclear weapon employment; they are also concerned with defense against enemy employment of chemical and biological munitions and against fallout resulting from enemy nuclear attacks.

B–3. Mission

The mission of the CBRE is to coordinate friendly chemical operations with other operations, to predict fallout resulting from friendly and enemy nuclear weapon employment, and to evaluate and disseminate information of CBR hazards resulting from friendly and enemy chemical and nuclear attacks and from enemy biological attacks.

B–4. Functions

A CBRE of a major tactical command TOC—

a. Coordinate friendly chemical and radiological operations with other operations.

b. Performs chemical target analysis and munition requirement computations.

c. Receives, collates, evaluates, and disseminates reports of enemy chemical, biological, and nuclear attacks.

d. Prepare and disseminates effective downwind messages.

e. Estimates the effects of enemy and friendly nuclear detonations and makes fallout predictions.

f. Estimates the ffects of enemy chemical and biological attacks and estimates the resulting chemical and biological hazard areas.

g. Provides estimates of the casualty producing effectiveness of and degree of hazard from friendly chemical attacks.

h. Coordinates chemical reconnaissance and radiological surveys with higher, lower, and adjacent units, and, if required, controls radiological surveys.

i. Plans and coordinates the collection of chemical and radiological contamination information.

j. Provides advice to the staff on the impact of chemically and radiologically contaminated terrain on tactical operations.

k. Maintains a CBR situation map.

l. Collates, evaluates, and disseminates CBR contamination data.

m. Maintains the radiation status reports of subordinate and attached units.

n. Provides advice to the G2 element on CBR intelligence matters.

o. Provides advice and recommendations pertaining to the use of herbicides.

p. Provides advice on flame and smoke operations.

B–5. Organization

a. CBRE at Division.

(1) Personnel for operating a CBRE at divi-

sion are provided by the division chemical staff section, augmented as required by personnel from a TOE 3–500 JA team.

(2) The minimum number of personnel required for a 24-hour operation of a CBRE at division is 10. The personnel include two Chemical Corps officers, one of whom is CBRE chief and the other is assistant CBRE chief, and eight enlisted men. The enlisted men are two CBRE sergeants, four CBRE specialists, and two clerk-typists. The personnel are organized into two 12-hour shifts of five members each. The CBRE chief is in charge of one shift and the assistant chief is in charge of the other shift. Each shift includes one sergeant who primarily is a plotter, two specialists who primarily are computers, and one clerk-typist.

b. CBRE at Corps and Field Army.

(1) Personnel for operating a CBRE at corps and at field army are provided from designated staff section(s), augmented as required by personnel from TOE 3–500 JA teams.

(2) At corps and field army, the requirements for CBRE personnel are greater than at division and depend on the size and scope of the CBRE operations.

B–6. Duties of Personnel

The duties of CBRE personnel vary with the level of the unit at which the CBRE operates; the requirements for processing and disseminating enemy chemical, biological, and nuclear attack data received from the NBC reporting system; the extent of data automation; the scale of the operations; and the experience and training of personnel. The chemical officer, or other designated staff officer, has staff supervision over the CBRE and is responsible for its operations.

a. CBRE Chief. The CBRE chief directs all CBRE functions of his shift under the staff supervision of the chemical officer or other designated staff officer. The CBRE chief—

(1) Analyzes potential chemical targets.

(2) Calculates munitions requirements for chemical targets.

(3) Calculates predicted effects resulting from friendly employment of chemical agents.

(4) Advises other elements of the TOC on the capabilities, employment, and effects of chemical agents.

(5) Coordinates friendly chemical operations with other operations.

(6) Predicts the effects from enemy use of chemical and biological weapons.

(7) Analyzes incoming radiological monitoring data to determine whether they adequately describe the radiological situation.

(8) Analyzes incoming radiological survey data, revises survey plans, and initiates requests for additional surveys.

(9) Predicts future contamination based on decay, weather, and stability of chemical and radiological contaminants.

(10) Disseminates CBR defense information.

(11) Analyzes radiation status reports of subordinate units and performs other radiological duties as set forth in FM 3–12.

b. Assistant CBRE Chief. The assistant CBRE chief directs all CBRE functions of his shift under the staff supervision of the chemical officer or other designated staff officer. His duties are the same as those of the CBRE chief.

c. CBRE Sergeant. The CBRE sergeant—

(1) Assists the shift chief in the overall supervision of the CBRE.

(2) Trains and cross-trains the CBRE specialists in plotting and computing duties.

(3) Coordinates the functions of the enlisted members of the CBRE and monitors their output.

(4) Periodically checks and insures accuracy of the plotting and computing work of the CBRE specialists.

(5) Monitors all information disseminated by the CBRE.

(6) Prepares predicted chemical and radiological contamination charts.

(7) Posts and maintains CBR situation maps and chemical and radiological contamination charts.

(8) Compiles chemical and radiological contamination plots for transmission by NBC reports according to the guidance contained in FM 21–40.

(9) Assists in the control of radiological surveys and performs other radiological duties as set forth in FM 3–12.

d. CBRE Specialists. The CBRE specialists cross-trained in the duties of computer and plotter.

(1) The computer—

(*a*) Prepares downwind travel predictions of enemy chemical and biological clouds.

(*b*) Calculates transmission factors or correlation factors, as applicable, from data reported by survey parties or monitors.

(*c*) Selects correction factors for radiological decay from tables, graphs, or nomograms.

(*d*) Converts all useful radiological contamination data to ground dose rates at a reference time by using the correlation factors.

(*e*) Maintains the radiation status reports of subordinate units.

(2) The plotter—

(*a*) Receives, processes, and plots chemical reconnaissance reports.

(*b*) Prepares CBR situation maps and overlays.

(*c*) Prepares chemical and radiological contamination charts.

(*d*) Decodes and encodes messages as required.

(*e*) Plots radiological data that have been corrected by the computer as necessary to obtain desired dose-rate contours.

(*f*) Draws radiological dose-rate contours from plotted data.

(*g*) Makes fallout predictions, using input data supplied.

(*h*) Receives and records incoming radiological survey and monitoring data as assigned.

(*i*) Transmits instructions to radiological survey parties and monitors as assigned.

e. Clerk-Typist. The clerk-typist—

(1) Acts as radio-telephone operator.

(2) Maintains the CBRE journal and message file.

(3) Prepares and dispatches messages.

(4) Assists in the preparation of chemical and radiological contamination overlays for transmission.

(5) Receives and records data on appropriate forms.

Section II. OPERATIONS OF THE CBRE OF A TOC

B–7. General

The information in paragraphs B–8 through B–15 pertaining to the operations of the CBRE is presented as a guide *only*. Actual operations depend on the organization and composition of the specific TOC of which the CBRE is one of the elements and on the procedures prescribed in the SOP of the unit TOC.

B–8. Coordination of the Employment of Chemical Weapons

FM 3–10-series manuals provide guidance on the employment of chemical weapons. FM 61–100 provides guidance on chemical fire support planning on the division level. When the CBRE participates in the planning for the employment of chemical weapons, it performs the following functions:

a. Chemical Munitions Status. It maintains the current readiness status of the unit's chemical munitions in coordination with the G4, fire support element (FSE), and with the G3 air group of the tactical air support element (TASE).

b. Target Analysis. It analyzes targets, particularly those that the G3 is considering for attack, to determine their vulnerability to chemical munitions. Included in the analyses are predictions as to the effects of the agents and possible resultant contamination on the targets. The CBRE coordinates the analyses with the fire support element (FSE) and with the TASE. It recommends to the FSE the type and amounts of chemical munitions to be used, the time of attack, and—after coordination with other TOC elements—the weapons delivery system to deliver the munitions..

c. Chemical Part of the Fire Support Plan. It prepares and submits to the FSE recommendations for the chemical part of the fire support plan.

d. Prediction of Chemical Contamination. It predicts the chemical contamination, based on actual conditions at the time of the attack; estimates the downwind hazard area expected from the chemical attacks and determines friendly troop safety requirements; and estimates the casualty-producing effectiveness of the chemical attacks on enemy forces.

e. Implementation of the Approved Chemical Fire Plan. Upon approval of the chemical part of the fire support plan, the CBRE—

(1) Provides information and advice to the other TOC elements regarding the type, degree, location, and duration of the contamination to be expected and the protection required for friendly troops.

(2) Disseminates to other TOC elements, other elements of the headquarters, subordinate units, and other commands as required, changes in the predicted chemical contamination and the

downwind chemical hazard areas caused by meteorological changes.

B–9. Prediction of Chemical Casualty-Producing Effectiveness

In predicting the casualty-producing effectiveness of chemical attacks on enemy forces, the CBRE—

a. Obtains from the G2 element a list of possible targets and analyzes them for attack by chemical fires. As many of the following factors as are known relating to enemy troop characteristics should be considered in the analysis:

(1) Defensive posture.

(2) Morale.

(3) Status of chemical defense training, including masking time.

(4) Previous exposures to chemical attack.

(5) Quality of protective and first-aid equipment and medical service.

(6) Probable activity that will affect rate of breathing.

(7) Other factors applicable to the specific situation.

b. Estimates the percentage and type of casualties to be expected from chemical attacks, based on the type and amount of munitions employed and the target intelligence.

c. Estimates the duration of incapacitation of casualties.

d. Makes an estimate of casualty effectiveness of the chemical attack and submits the estimate to the FSE and the G2 and G3 elements.

B–10. Preparation and Dissemination of Fallout Predictions

The CBRE predicts fallout resulting from nuclear attacks by friendly and enemy forces and disseminates the predictions. Detailed information for making predictions of fallout from friendly and enemy nuclear attacks is given in TM 3–210 and from enemy attacks is given in FM 3–12.

a. Friendly Forces. For nuclear burst by friendly forces, the CBRE—

(1) Before the burst, receives information as to the planned yield, height of burst, and ground zero from the FSE. It makes the fallout prediction and provides the prediction to the FSE for incorporation in the target analysis being prepared by the FSE.

(2) After the burst, prepares fallout predictions based on preselected yields, height of burst, and ground zero, and disseminates these predictions to all TOC elements and to other headquarters, units, or agencies as prescribed in the SOP or as directed by the G3 element.

b. Enemy Forces. For nuclear bursts by enemy forces, the CBRE—

(1) Using data resulting from intelligence or operational experience, prepares fallout predictions. These predictions are made at intervals and disseminated as prescribed in the SOP or as directed by the G2 element.

(2) Using changes in meteorological data occurring after the initial prediction, prepares revised fallout predictions as required and disseminates them as prescribed in the SOP or as directed by the G2 element.

B–11. Coordination of Radiological Monitoring and Surveys

The CBRE coordinates radiological monitoring reports and may coordinate and control radiological surveys.

a. Radiological Monitoring, The CBRE receives, processes, and plots radiological monitoring reports from subordinate and other units. When the monitoring information is inadequate concerning an area of interest to the unit, the CBRE, in coordination with appropriate TOC elements, recommends the radiological surveys that should be conducted.

b. Radiological Survey. When a radiological survey, either aerial or ground, is controlled directly by the headquarters that ordered the survey, the CBRE acts as the control party, briefs the survey parties, and coordinates the survey by prescribing the areas to be surveyed and the type, amount, frequency, and manner of reporting.

c. Radiological Monitoring and Survey Procedures. Detailed procedures pertaining to radiological monitoring and survey are contained in FM 3–12.

B–12. Prediction of Downwind Hazard Areas From Enemy Chemical and Biological Attacks

The CBRE predicts downwind hazard areas from enemy chemical and biological attacks and prepares warnings for dissemination to subordinate and, if appropriate, adjacent units according to the guidance contained in FM 21–40. The CBRE —

a. Receives initial NBC reports of enemy chemical or biological attacks.

b. Using current meteorological data, predicts downwind hazard areas.

c. Prepares NBC reports, giving four coordinates of the downwind hazard area, for dissemination to subordinate and, if appropriate, adjacent units.

B–13. Evaluation of Chemical and Radiological Contamination Data

The CBRE evaluates chemical and radiological contamination data received from subordinate units and disseminates warnings as described below. It—

a. Receives, processes, and plots chemical and radiological contamination data received from NBC reports, which are described in FM 21–40.

b. Maintains a radiation situation map or overlay that shows the actual contamination at a preselected time for the area of interest. It may also show predicted fallout. Based on decay and on additional contamination, the degree of contamination is recomputed and adjusted several times daily as prescribed in the SOP.

c. Maintains a chemical contamination map or overlay. The degree of chemical contamination is adjusted daily, based on NBC reports from subordinate units.

d. Prepares contamination charts and disseminates them as prescribed in the SOP or as directed by the G2 element.

e. Prepares and disseminates an estimate of contamination expected at a designated time in the future, as directed by the G2 element.

B–14. Evaluation of Impact of Chemical and Radiological Contamination on Tactical Operations

The CBRE evaluates the impact of chemical and radiological contamination on tactical operations and provides the G3 element with the evaluation. The evaluation may include information on—

a. The degree of contamination at selected points or areas.

b. The effect on tactical units.

c. The protection required by troops operating in designated areas.

d. The length of time troops can safely operate in designated areas.

e. The amount and type of units, supplies, and equipment required to decontaminate troops, equipment, and supplies after operations in the contaminated area.

B–15. Processing of NBC Reports of Enemy Nuclear, Biological, and Chemical Attacks

The CBRE plots and displays the location, time, number, and extent of enemy nuclear, biological, and chemical attacks within its zone. This provides information on enemy nuclear, biological, and chemical activities and on radiological hazards during the time covered by operational reports (to include strikes reported, nuclear yields employed, a brief assessment of the significance of these strikes, and other deductions that can be made). The CBRE uses the NBC reports described in FM 21–40 in disseminating and exchanging CBR hazard information.

Section III. ORGANIZATION AND FUNCTIONS OF A CBRC

B–16. General

A CBR center (CBRC) is organized at regiment and separate brigade when authorized by the commander.

B–17. Organization

The minimum personnel required for the 24-hour operation of a CBRC are the same as required by a CBRE of a TOC at division (para B–5*a*(2)). Personnel for CBRC operations either are organic to the unit or are provided by TOE 3–500 CBRE teams, JA or JB, attached or assigned to the unit.

B–18. Functions

The functions and operations of a CBRC are similar to those of a CBRE of a TOC discussed in sections I and II, except they are on a reduced scale.

Section IV. ORGANIZATION AND FUNCTIONS OF THE CBRE OF A RAOC

B–19. General

A CBRE is organized as an element of a rear area operations center (RAOC) when authorized by the commander. Rear area operations centers are found at corps and at support groups throughout the theater of operations, that is, support groups of the army support brigade, independent corps support command, and area support command.

B–20. Organization

Personnel for CBRE operations equivalent to a CBRE team, JB, are organic to the rear area operations support center (TOE 29–408) which is assigned to corps and each support group. The organization of the RAOC is discussed in FM 31–85.

B–21. Functions

The CBRE activities are concerned primarily with measures for minimizing the effects of enemy chemical and biological attacks and fallout resulting from enemy nuclear attacks in rear areas. They are also concerned with the employment of riot control and smoke munitions within the capabilities of rear area protection forces. Detailed functions of the CBRE are discussed in FM 31–85.

INDEX

	Paragraph	Page
Ammunition:		
Chemical:		
Disposal	7–12	7–3
Grouping	7–9	7–2
Safety and security	7–11*c*	7–3
Supply	7–4	7–1
Technical escort	7–11*d*	7–3
Conventional	7–9	7–2
Special	7–9	7–2
Base chemical laboratory	2–9*a*	2–3
Biological agent:		
Identification	2–18, 6–3*b*	2–4, 6–2
Sampling	2–18, 5–23, 5–24*g*, 6–3*b*	2–4, 5–5, 5–6, 6–2
Biological decontaminating agent sprayers	4–6*c*	4–3
CBR:		
Agent:		
Sampling and analysis team	2–18, 5–23	2–4, 5–5
Sampling and analyzing kit	2–9*b*, 5–23, 5–24, 6–3*b*, 6–5*h*	2–3, 5–5, 5–6, 6–2, 6–3
Combat service support planning:		
Factors	9–5	9–4
Indigenous labor	9–7—9–9	9–5
Phases	9–4	9–2
Element teams	5–22	5–5
Noncommissioned officer	8–4	8–1
Officer	8–4	8–1
Reconnaissance teams	2–18, 5–24, 6–6	2–4, 5–6, 6–3
Staff (SF) team	5–26	5–10
Supplies, classes:		
II and VII	7–1, 7–2	7–1
V	7–1, 7–4	7–1
IX	7–1, 7–3	7–1
Technical intelligence:		
Collection team	2–18, 6–3*b*, 6–6	2–4, 6–2, 6–3
Team	6–4*b*, 6–6	6–2, 6–3
Chemical:		
Agent:		
Analysis	2–7, 2–17, 2–18, 6–5	2–1, 2–4, 6–2
Identification	2–3, 2–7, 2–18, 5–23, 6–3*b*, 6–5	2–1, 2–4, 5–5, 6–5
Sampling	2–7, 2–17, 5–23, 5–24*g*, 6–3*b*	2–1, 5–5, 5–6, 6–2
Combat support team:		
Capabilities	5–12	5–2
Functions	5–15	5–2
Operational organization	5–14	5–2
Equipment:		
Collection and classification	7–8	7–2
Repair teams, DS/GS	7–7	7–2

	Paragraph	Page
Chemical—Continued		
Laboratory. (*See* General chemical laboratory.)		
Maintenance support	7–5	7–1
Noncommissioned officer	8–5	8–1
Officer functions:		
Brigade/regiment	8–6	8–1
CBR staff (SF) team	5–26	5–10
Division, corps, and army	8–7	8–1
FASCOM and TASCOM	8–9, 8–10	8–2
Processing company:		
Assignment and allocation	3–6	3–2
Capabilities	3–7	3–2
Covered space requirements	3–19	3–4
Functions	3–11	3–2
Limitations	3–8	3–2
Mission	3–5	3–2
Organization	3–10	3–2
Site	3–16, 3–17	3–4
Water requirements	3–20	3–4
Clothing:		
Decontamination	3–22	3–4
Impregnating plant	3–12	3–3
Impregnation capability:		
Chemical processing company	3–7*a*	3–2
Field service company, general support:		
Army	3–3*e*	3–1
Forward	3–3*d*	3–1
Laundry and renovation company, general support	3–3*b*	3–1
Supply and service company, direct support	3–3*c*	3–1
Permeable protective	3–2	3–1
Protective	4–8	4–4
Collection and classification company	7–8	7–2
Covered space requirements:		
Chemical processing company	3–19	3–4
General chemical laboratory	2–11	2–3
Decontaminating apparatus, power-driven	4–2, 4–6*a*, 4–10, 7–1	4–2, 4–3, 4–4, 7–1
Decontamination:		
Platoon	4–2	4–2
Station:		
Personnel	4–1, 4–2*a*, 4–5, 4–11	4–1, 4–2, 4–3, 4–4
Vehicular equipment	4–5, 4–11	4–3, 4–4
Supplies	4–7	4–3
Team:		
Attachment	4–3	4–3
Capabilities	4–5	4–3
Operational organization	4–10	4–4
Water supply requirements	4–9	4–4
Defoliation:		
Operations	4–5, 5–12	4–3, 5–2
Operations subelement	5–15*d*	5–3
Explosive ordnance disposal (EOD) detachment	2–18, 7–12	2–4, 7–3
Field:		
Depot	2–18*a*, 3–3*b*, 3–6, 3–15	2–5, 3–1, 3–2, 3–3
Service company, general support:		
Army	3–3*e*, 4–2	3–1, 4–2
Forward	3–3*d*, 4–2	3–1, 4–2
Firefighting	4–2, 4–5, 5–12, 5–15*d*	4–2, 4–3, 5–2, 5–3

	Paragraph	Page
Flame:		
Expedients	5–12, 5–15*c*, 5–25	5–2, 5–3, 5–7
Operations subelement	5–15*c*	5–3
Flamethrower:		
Mechanized	5–25*f*	5–8
Service unit	5–25*f*	5–8
Support	5–12, 5–25*b*	5–2, 5–7
General chemical laboratory:		
Assignment and allocation	2–2	2–1
Capabilities	2–3	2–1
Coordination with other units	2–18	2–4
Covered space requirements	2–11	2–3
Functions	2–7	2–1
Limitations	2–4	2–1
Mission	2–1	2–1
Organization	2–6	2–1
Security	2–15	2–4
Site	2–11, 2–12	2–3
Water requirements	2–14	2–4
Impact of CB and nuclear weapon employment on:		
Civil affairs	9–11*g*	9–6
Labor	9–11*f*	9–6
Maintenance	9–11*b*	9–6
Medical evacuation and hospitalization	9–11*c*	9–6
Personnel	9–11*e*	9–6
Supply	9–11*a*	9–5
Transportation	9–11*d*	9–6
Insect control	1–2*b*, 4–5	1–1, 4–3
Intelligence section, general chemical laboratory	2–7*i*	2–2
Laboratory:		
General chemical. (*See* General chemical laboratory.)		
Medical. (*See* Medical laboratory.)		
Operational:		
Chemical engineering	2–6, 2–7*h*, 2–17	2–1, 2–2, 2–4
Inorganic chemistry	2–6, 2–7*d*	2–1, 2–2
Instrument	2–6, 2–7*e*	2–1, 2–2
Organic chemistry	2–6, 2–7*c*, 2–17	2–1, 2–2, 2–4
Radiological physics	2–6, 2–7*g*	2–1, 2–2
Toxicology	2–6, 2–7*f*, 2–17	2–1, 2–2, 2–4
Laundry and renovation company, general support	3–3*b*	3–1
Maintenance support system	7–6	7–2
Mechanized flamethrower teams:		
Allocation	5–25*d*	5–8
Capabilities	5–25*b*	5–8
Duties	5–25*h*	5–9
Operational organization	5–25*g*	5–8
Medical laboratory	2–18, 5–23*b*, 5–24*h*, 6–1*b*, 6–2*b*, 6–5*c*	2–4, 5–5, 5–7, 6–1, 6–1, 6–3
Military intelligence company, technical intelligence	2–7*i*, 2–18, 6–4*a*, 6–6	2–2, 2–4, 6–2, 6–3
Nuclear weapons effects officer	8–8	8–1
Personnel detector:		
Operations	1–2*b*, 5–12	1–1, 5–2
Operations subelement	5–15*e*	5–3

	Paragraph	Page
Radiological agent:		
Analysis	2–7*g*	2–2
Identification	2–3	2–1
Sampling	5–23*b*, 6–3*b*	5–5, 6–2
Riot control agent:		
Operations	5–12	5–2
Operations subelement	5–15*b*	5–3
Shower service	1–2*b*, 4–2, 4–5, 5–12, 5–15*d*	1–1, 4–2, 4–3, 5–2, 5–3
Special forces teams:		
CBR reconnaissance	2–18, 5–24, 6–3*c*	2–4, 5–6, 6–2
CBR staff	5–26	5–10
Stability operations	1–2	1–1
Supply and service company, direct support	3–3*c*, 4–3, 7–2*a*	3–1, 4–3, 7–1
Supply of CBR supplies	7–2—7–4	7–1
Water supply requirements:		
Chemical processing company	3–8, 3–16	3–2, 3–4
Decontamination team	4–9	4–4
General chemical laboratory	2–14	2–4

By Order of the Secretary of the Army:

W. C. WESTMORELAND,
General, United States Army,
Chief of Staff.

Official:

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

Distribution:

To be distributed in accordance with DA Form 12–11 requirements for Chemical, Biological, and Radiological Operations.

AGO 7729A

☆U. S. GOVERNMENT PRINTING OFFICE : 1970 390–808/7729

FIELD MANUAL
FM 3-1

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *6 February 1970*

CHEMICAL, BIOLOGICAL, AND RADIOLOGICAL (CBR) SUPPORT

		Paragraphs	Page
CHAPTER 1.	INTRODUCTION	1-1—1-3	1-1
2.	GENERAL CHEMICAL LABORATORY	2-1—2-19	2-1—2-5
3.	CLOTHING IMPREGNATION		
Section I.	Introduction	3-1—3-4	3-1, 3-2
II.	Chemical Processing Company	3-5—3-24	3-2—3-5
CHAPTER 4.	CBR SUPPORT DECONTAMINATION		
Section I.	Introduction	4-1—4-3	4-1—4-3
II.	Decontamination Team, FB	4-4—4-11	4-3—4-4
CHAPTER 5.	SUPPORT TEAMS		
Section I.	Introduction	5-1—5-7	5-1
II.	Chemical Combat Support Team, PA	5-8—5-20	5-1—5-4
III.	Other Support Teams	5-21—5-26	5-5—5-11
CHAPTER 6.	CBR TECHNICAL INTELLIGENCE	6-1—6-6	6-1—6-3
7.	SUPPLY, MAINTENANCE, AND AMMUNITION SERVICE		
Section I.	Supply	7-1—7-4	7-1
II.	Maintenance	7-5—7-8	7-1, 7-2
III.	Ammunition Service	7-9—7-12	7-2, 7-3
CHAPTER 8.	STAFF SERVICES		
Section I.	Introduction	8-1, 8-2	8-1
II.	Functions and Responsibilities	8-3—8-10	8-1, 8-2
CHAPTER 9.	PLANNING CBR COMBAT SERVICE SUPPORT		
Section I.	Planning Phases and Factors	9-1—9-6	9-1—9-5
II.	Planning for Use of Indigenous Labor	9-7—9-9	9-5
III.	Impact of CB and Nuclear Weapon Employment	9-10, 9-11	9-5
APPENDIX A.	REFERENCES		A-1
INDEX			Index-1

*This manual supersedes FM 3-1 (Test), 23 January 1967.

Section III. OTHER SUPPORT TEAMS

5–21. Decontamination Team, FB

The decontamination team, FB, is discussed in chapter 4.

5–22. CBR Element (CBRE) Teams, JA and JB

a. Mission and Capabilities. The mission of the CBR element teams, JA and JB, is to provide CBR element operational support to various headquarters, including those of major tactical and combat service support units. The JA and JB teams are capable of providing this support for one 12-hour shift and for two 12-hour shifts, respectively.

b. Assignment.

(1) The JA team may be assigned to the headquarters of an organization that requires the operation of a CBR element on a one-shift (12-hour) basis or that requires augmentation of the CBR element of the tactical operations center to provide a two-shift (24-hour) operational capability for the CBRE.

(2) The JB team may be assigned to the headquarters of an organization that does not have an organic CBR element but that requires operation of a CBR element on a two-shift (24-hour) basis.

c. Mobility. The JA and JB teams have 100 percent ground mobility with organic vehicles and 100 percent air transportability.

d. Composition.

(1) The JA team is composed of one officer who is chief of a 12-hour duty shift and four enlisted personnel consisting of one operations sergeant, two operations specialists, and one clerk-typist.

(2) The JB team is equivalent to two JA teams and is composed of two officers, each of whom is chief of one of the two 12-hour shifts, and eight enlisted personnel consisting of two operations sergeants, four operations specialists, and two clerk-typists.

e. Duties of Personnel. The duties of the personnel of the JA and JB teams are listed in FM 21–40 and FM 3–12.

5–23. CBR Agent Sampling and Analysis Team, KA

a. Mission. The mission of the KA team is to perform CBR agent field sampling and analyzing operations.

b. Capabilities. By operating the ABC-M19 CBR agent sampling and analyzing kit, the KA team is capable of—

(1) Sampling known and unknown chemical agents in the form of solids, liquids, aerosols, smokes, and vapors from water, air, and soil.

(2) Identifying known chemical agents.

(3) Identifying functional components of unknown chemicals and indicating by that means the type of "family" of the unknown chemical agents.

(4) Sampling biological agents from water and soil.

(5) Sampling radiological agents from surfaces and soil.

(6) Collecting and forwarding samples of radiological agents and unknown chemical agents to a general chemical laboratory for identification.

(7) Collecting and forwarding samples of biological agents to a medical laboratory for identification.

c. Basis of Allocation. The KA team is allocated on the basis of one or more per division or equivalent or larger size unit as required.

d. Mobility. The KA team has 100 percent ground mobility with organic vehicles and 100 percent air transportability.

e. Mission Equipment. The principal item of mission equipment is M19 CBR agent sampling and analyzing kit. The kit essentially is a portable field chemical laboratory. A trained technician is required to operate the kit and perform tests. An organic chemist is required to evaluate the results of the tests. Operating instructions are contained in TM 3–6665–205–10/1, and sampling and analyzing procedures are contained in TM 3–6665–205–10/2.

f. Composition. The KA team consists of one officer who is an organic chemist and one enlisted chemical laboratory specialist who is the kit operator.

g. Duties of Personnel.

(1) The organic chemist supervises the work of the kit operator, evaluates and interprets the results of the tests, and informs the chemical officer of the unit to which the team is attached as to the results of the tests.

(2) The kit operator takes samples, performs tests, and as an additional duty drives the team's vehicle.

h. Operations.

(1) The KA team operates under the staff supervision of the officer of the division or other unit to which it is attached.

(2) The team conducts chemical agent tests not only on samples that it collects but also on white-band tube samples collected and forwarded to it by units equipped with ABC-M18-series chemical agent detector kits or with M34 CBR agent sampling kits. If the results of the tests indicate the submitted samples represent unknown chemical agents, the KA team notifies the collecting unit so that it can take fresh samples at the earliest opportunity. The collecting unit forwards the new samples directly to the general chemical laboratory for analysis.

(3) The team is capable of conducting sampling and analyzing operations at night by use of an ultraviolet lamp and kit components color coded and marked with fluorescent paint.

(4) Sampling components of the kit will function at temperatures as low as —25°F. The analyzing components will function at temperatures ranging from 32°F. to 115°F.

(5) FM 21–40 contains additional information pertaining to the operations of the team and its relationship with the theater CBR agent detection and identification system.

i. Communications Equipment. Communications equipment consists of one AN/VRC–46 radio set mounted in the team's ¾-ton cargo truck.

5–24. CBR Reconnaissance LA Team and LB Team (SF)

a. Mission. The mission of the CBR reconnaissance LA team is to perform CBR reconnaissance. The special forces (SF) team, LB, also has this mission and additionally has the mission to provide CBR technical intelligence.

b. Capabilities.

(1) The LA and LB teams are capable of performing CBR reconnaissance of the site of a nuclear, chemical, or biological attack and providing essential reconnaissance data.

(2) The LB team is additionally capable of photographing and reporting on elements of CBR technical intelligence and expediting the flow of captured materiel.

c. Basis of Allocation.

(1) The LA team is allocated on the basis of one or more per armored cavalry regiment or equivalent or larger size unit as required.

(2) The LB team is allocated on the basis of one or more per special forces unit as required to provide CBR reconnaissance and technical intelligence capabilities.

d. Mobility.

(1) The LA team has 100 percent ground mobility with organic vehicles and 100 percent air transportability.

(2) As the LB team has no organic ground vehicle, it is dependent upon the capture or confiscation of vehicles within a denied area during limited or general war and requires vehicle augmentation during internal defense operations. It has 100 percent air transportability and can be landed by parachute.

(3) When the site of a nuclear, chemical, or biological attack is inaccessible to ground vehicles or when speed in obtaining information is essential, the LA and LB teams are dependent upon aviation units to provide air transportation.

e. Mission Equipment. The principal mission equipment of the LA and LB teams includes the M19 CBR agent sampling and analyzing kit, M18-series chemical agent detector kit, and IM-174A/PD radiacmeter. The LB team is additionally equipped with a still picture camera set.

f. Composition.

(1) The LA team consists of one CBR reconnaissance officer and four enlisted personnel including a CBR reconnaissance sergeant, a CBR identification kit operator, a reconnaissance sergeant, and a CBR reconnaissance specialist.

(2) The LB team consists of one officer and five enlisted personnel. The composition is the same as that of the LA team except that the LB team includes one additional enlisted member who is a CBR technical intelligence specialist.

g. Duties of Personnel.

(1) The CBR reconnaissance officer—an organic chemist—commands the team. His duties include—

(*a*) Directing the operations of the team.

(*b*) Evaluating and interpreting the results of tests made by use of the M19 CBR agent sampling and analyzing kit.

(*c*) Reporting the results of the team's operations to appropriate headquarters by the fastest means available.

CHAPTER 7

SUPPLY, MAINTENANCE, AND AMMUNITION SERVICE

Section I. SUPPLY

7–1. CBR Supplies

CBR supplies fall into four of the ten classes of supply which are defined in FM 100–10. The four classes are II, V, VII, and IX. An example of CBR supplies included in each of the four classes is listed below.

a. Protective masks: class II.

b. Chemical ammunition: class V.

c. Power-driven decontaminating apparatuses: class VII.

d. Repair parts for mechnical smoke generators: class IX.

7–2. Classes II and VII Supply

a. DS Supply. Direct support (DS) supply of classes II and VII CBR supplies is provided nondivisional units in the theater of operations by the DS supply and service company (TOE 29–147). Details pertaining to DS supply and to the operations of the company are contained in FM 29–3–1.

b. GS Supply. For purposes of general support (GS) supply in the field army, classes II and VII supplies are grouped as general supplies and heavy materiel supplies. Examples of CBR supplies grouped as general supplies are protective masks and chemical agent detector kits. Examples of CBR supplies grouped as heavy materiel supplies are power-driven decontaminating apparatuses and vehicle-mounted flamethrower service units. GS supply of general and heavy materiel supplies is provided by the general support general supply company and the general support heavy materiel supply company, respectively. Details pertaining to GS supply in the field army and to the operation of the GS supply companies are contained in FM 29–45–1 (Test).

c. Supply in Divisions and Separate Brigades. Classes II and VII CBR supplies are supplied to units in divisions and separate brigades through distribution points operated by division and separate brigade supply units, respectively. Details pertaining to supply in divisions and separate brigades and to the operations of the supply units are contained in FM 29–50.

7–3. Class IX (Repair Parts) Supply

a. DS Supply. Direct support supply of class IX supplies, including repair parts for chemical equipment, is provided by DS maintenance units rather than through supply channels.

(1) Details pertaining to DS supply of repair parts to nondivisional units are contained in FM 29–22.

(2) Details pertaining to DS repair parts supply in divisions and separate brigades are contained in FM 29–30.

b. GS Supply. General support supply of class IX supplies, including repair parts for chemical equipment, in the field army is provided by the GS repair parts company. Details pertaining to the GS supply of repair parts and operations of the company are contained in FM 29–45–1 (Test).

7–4. Class V Supply

The supply of class V supplies, including chemical ammunition, in the theater is a function of ammunition service and is provided by ammunition units. Details pertaining to class V supply and to the operations of the ammunition units are contained in FM 9–6.

Section II. MAINTENANCE

7–5. Chemical Maintenance Support

Chemical maintenance support formerly provided by chemical maintenance units is provided by functionalized direct and general support maintenance units. These units have chemical equipment repairmen and specialists assigned to perform the

maintenance. Items of chemical equipment for which chemical equipment repairmen are authorized are listed in AR 310–32. Detailed instructions for the maintenance of an item of chemical equipment are contained in the 3-series technical manual pertaining to that item.

7–6. Maintenance Support System

a. Information pertaining to the principles, functions, and management of the maintenance support system in theaters of operation is contained in FM 29–20.

b. Information pertaining to the nondivisional direct support and general support maintenance of chemical equipment and direct support chemical equipment repair parts supply provided within the field army area and communications zone by maintenance units is contained in FM 29–22.

c. Information pertaining to the direct support maintenance of chemical equipment and direct support chemical equipment repair parts supply provided within divisions and separate brigades by maintenance units is contained in FM 29–30.

7–7. DS/GS Chemical Equipment Repair Teams

Chemical equipment repair teams EP, EQ, and ER (TOE 29–610) provide DS and/or GS maintenance of chemical equipment. The teams are 100 percent mobile and are assigned to division, corps, army, communications zone, or theater for attachment as required. They are capable of performing inspection, testing, and DS/GS repair. The 5-member EP team, 7-member EQ team, and 10-member ER team are composed of chemical equipment repairmen. In each team one chemical equipment repairman serves as team chief.

7–8. Collection and Classification Company (TOE 29–139)

Collection and classification companies are attached to the GS maintenance battalions that provide GS maintenance in the field army area and in the communications zone.

a. The company establishes and operates a collection and classification point for the receipt, inspection, segregation, disassembly, preservation, and disposition of serviceable, unserviceable, or abandoned U.S. materiel including chemical equipment. It also assists the technical intelligence effort in the processing and disposition of captured items of foreign materiel except explosive items.

b. Company personnel include a chemical equipment inspector and a chemical equipment repairman.

c. Information pertaining to the organization and operations of the company is contained in FM 29–22.

Section III. AMMUNITION SERVICE

7–9. Ammunition Grouping

Ammunition is divided into two groups—conventional and special.

a. Conventional ammunition includes all ammunition items that do not require extraordinary control, handling, or security.

b. Special ammunition items are those that require extraordinary control, handling, or security.

c. Certain chemical ammunition items are grouped as conventional ammunition, and certain chemical ammunition items are grouped as special ammunition.

(1) Chemical ammunition items grouped as conventional ammunition include ammunition filled with smoke, incendiary, and riot control agents.

(2) Chemical ammunition items grouped as special ammunition include those filled with lethal and incapacitating chemical agents.

d. Bursters and igniters for chemical ammunition and peptizers and thickeners for flame fuels are grouped as conventional ammunition.

7–10. Ammunition Supply, Distribution, and Maintenance

Details pertaining to the supply, distribution, and maintenance of conventional and special ammunition are contained in FM 9–6.

7–11. Ammunition Service for Chemical Ammunition

a. Ammunition service for chemical ammunition includes the supply functions of distribution and maintenance while in storage. Specific functions

CHAPTER 8

STAFF SERVICES

Section I. INTRODUCTION

8–1. General

CBR staff services are provided commanders at all levels to assist them in assuring that their units and commands attain an operational and materiel readiness and an operational capability to carry out their missions during conditions involving employment of chemical, biological, and nuclear weapons.

8–2. Scope

The scope of the CBR staff services required by a commander varies with the level and size of the unit or command. For example, the CBR staff services requirements of an army commander are more numerous and more complex than those of a battalion commander. The scope of the services also varies with the type of unit. For example, the scope of the staff services requirements of the commander of a tactical unit would normally include the area of offensive employment of chemical weapons, whereas the requirements of the commander of a nontactical unit would normally not include this area.

Section II. FUNCTIONS AND RESPONSIBILITIES

8–3. General

Functions and responsibilities pertaining to CBR staff services for selected units and commands are discussed in this section.

8–4. Company/Battery/Troop

CBR staff services are provided the commander of a company, battery, or troop by designated unit personnel. They are a school-trained CBR officer, a school-trained CBR noncommissioned officer (NCO), and an enlisted alternate who are appointed on orders by the unit commander to serve on an additional duty basis. Functions of company/battery/troop CBR personnel are listed in FM 21–40.

8–5. Battalion/Squadron

The duties of a battalion chemical NCO—a chemical staff specialist—are listed in FM 7–20. The duties are applicable to a squadron chemical NCO.

8–6. Brigade/Regiment

The duties of a brigade chemical officer—a Chemical Corps officer—are listed in FM 17–1. The duties are applicable to a regiment chemical officer.

8–7. Division, Corps, and Field Army

a. At the division level of command, the CBR staff functions are performed by the division chemical officer—a Chemical Corps officer—who heads the chemical section of the division special staff.

b. As there is no chemical special staff section at corps and field army levels of command, CBR staff functions are performed by Chemical Corps officers who are integrated into appropriate general staff sections, that is, assistant chief of staff (ACofS), G2; ACofS, G3; and ACofS, G4.

c. Chemical officer duties and responsibilities at division, corps, and field army levels are listed in FM 101–5.

8–8. Nuclear Weapons Effects Officer

At corps headquarters and at field army headquarters, there is a nuclear weapons effects officer—a Chemical Corps officer—who is assigned to the ACofS, G3 section. His duties include the provision of technical advice and assistance on the nonmedical aspects of the effects of nuclear weapons.

8–9. CBR Staff Functions in Major Combat Service Support Field Command Headquarters

The responsibilities for CBR staff functions in two major combat service support field command headquarters, that is, theater army support command (TASCOM) and field army support command (FASCOM), are discussed in this paragraph. These functions are performed by Chemical Corps officer and enlisted personnel assigned to the appropriate ACofS section. The duties performed by the Chemical Corps personnel include the provision of assistance in—

a. Compiling the phased chemical troop basis.

b. Determining requirements for chemical units.

c. Recommending priorities for chemical units.

d. Recommending priorities for the allocation of chemical equipment within the command.

e. Preparing plans, policies, and programs pertaining to chemical operations.

f. Planning and supervising the CBR training of headquarters and subordinate units.

g. Planning for the protection of personnel, facilities, and materiel of the command from enemy CB and nuclear attacks.

h. Maintaining the radiation dose status chart of subordinate and attached units.

i. Preparing broad guidance and policies for the maintenance of chemical equipment.

j. Reviewing, analyzing, and evaluating chemical materiel status reports.

k. Establishing maintenance standards for the inspection of chemical materiel and disseminating the data to subordinate units.

l. Reviewing priority schedules for the reconditioning of chemical equipment.

m. Establishing and disseminating policies for the collection and evacuation of captured CBR materiel.

n. Preparing plans and policies pertaining to the collection, processing, and dissemination of information of CBR intelligence value.

o. Establishing policies and providing broad guidance for the CBR portion of the area damage control activities of the command.

8–10. CBR Staff Functions in TASCOM and FASCOM Units

CBR staff functions in TASCOM and FASCOM units are performed by Chemical Corps officer and enlisted personnel assigned to appropriate staff sections. The functions are specifically oriented toward the provision of technical advice and assistance in areas that include the—

a. Storage and distribution of chemical materiel.

b. Maintenance and modification of chemical materiel.

c. Technical escort of hazardous chemical ammunition and radioactive waste.

d. Recovery, evacuation, salvage, and disposal of chemical materiel.

e. Surveillance, renovation, and disposal of chemical ammunition.

f. Management of chemical materiel.

g. CBR decontamination.

h. Protective clothing impregnation or reimpregnation.

i. CBR aspects of area damage control.

j. CBR technical intelligence.

CHAPTER 9

PLANNING CBR COMBAT SERVICE SUPPORT

Section I. PLANNING PHASES AND FACTORS

9–1. General

a. CBR combat service support planning is accomplished concurrently with the planning for the combat operation. The closest coordination between combat and logistical planning is required because of the major effect of logistical support on the ability of a command to carry out combat operations. A service support plan *cannot* be formulated without coordination with all other arms and services. Consideration must be given to the impact that the employment of CB and nuclear weapons will have on CBR combat service support. CBR operations may increase requirements in service support personnel and materiel. Enemy capabilities for employment of CB and nuclear weapons must be constantly evaluated.

b. Anticipating demands is a prime function of every staff officer. The CBR plan outlines methods for fulfillment of these demands. There is no prescribed form, but a plan will normally consist of sections dealing with the significant elements of CBR combat service support, such as—

(1) Requirements for and employment of chemical personnel and units.

(2) Chemical maintenance support.

(3) CBR class II, VII, and IX supply.

(4) Chemical class V supply.

(5) Reclamation of captured CBR materiel.

(6) Evacuation and disposal of CBR materiel.

(7) Specialized services.

c. To achieve the basic objective of support for tactical operations, any logistical plan should be devised with the following elements in mind:

(1) Efficient use of transportation.

(2) Reduction in the multiple handling of supplies.

(3) Reduction in order and shipping times.

(4) Elimination, or reduction to a minimum, or requirements that do not contribute directly to the progress of combat operations.

(5) Maximum and efficient use of manpower.

(6) Economical use of supplies and equipment.

(7) Reduction in items that are nice to have but are not essential.

(8) Simplification of work, to include the use of the latest mechanical methods for handling supplies and the use of automatic electronic devices for supply control.

(9) Establishment and maintenance of minimum supply levels.

(10) Establishment of alternate means to provide support so as to obtain flexibility.

(11) Provisions for mobility of installations.

(12) Establishment and coordination of rear area protection (rear area defense and area damage control).

(13) Provisions for dispersion of units and installations.

d. Inherent in any plan is the requirement for methods of avoiding excessive losses, particularly those that may be caused by CB and nuclear weapons. Consideration must be given to—

(1) Establishment of multiple, properly dispersed facilities and installations.

(2) Use of cover, concealment, camouflage, and revetments.

(3) Use of covered storage to the extent feasible to avoid contamination of materiel.

(4) Duplication of essential stock control records.

(5) Need for alternate communication facilities.

(6) Provision for plans and organization for area damage control.

(7) Provision for alternate facilities, installations, and transportation means to insure continuous support for the combat forces.

(8) Protection for indigenous labor.

(9) Continuous evaluation of the enemy capability.

9–2. Responsibility for Planning

Each echelon is responsible for making plans that are based on the plans of the next higher echelon. Subordinate units must be furnished with data that will affect their planning as soon as these data are development. Planning, however, must proceed even when complete instructions from higher headquarters have not been furnished. The importance of continuous planning cannot be overemphasized. Planning involves the use of known information supplemented by assumptions where facts are not available. Chemical planners must be alert to detect or anticipate changing conditions and to modify plans to meet each change.

9–3. Planning Considerations

The first element of chemical planning is to determine and evaluate the CBR support mission. This portion of the plan involves determining the significant elements of CBR support that will be required. A troop list can them be developed, and the requirements for CBR supplies may be calculated; thus the basis is formed for a chemical support organization and logistical plan.

a. The following general steps are essential to the accomplishment of sound troop requirements planning:

(1) Determination of the functions or tasks to be performed.

(2) Determination of the number of troops to be supported.

(3) Selection of type of operating unit, with capability required.

(4) Calculation of number of operating units required.

(5) Provisions for command and control.

b. Many factors influence the number and type of chemical troops required to support any given operation. Principal factors are—

(1) Number and type of troops to be supported, their mission, and the extent of CBR combat service support to be provided them.

(2) Climate and terrain.

(3) Size of the geographical area of operations.

(4) Attitude, availability, and capabilities of local civilians and prisoners of war.

(5) Local resources.

(6) Capabilities of chemical and multifunctional units.

(7) Enemy capabilities.

(8) CBR situation.

c. The task of determining supply requirements is basically one of forecasting the demand for each item required by all support forces in sufficient time to insure the arrival of the item at the time and place it is needed. Supply requirements are classified as follows and are discussed in more detail in FM 100–10:

(1) Initial supply requirements to provide for the initial issue of supplies or to complete shortages in the initial issue.

(2) Replacement and consumption requirements to keep the initial equipment up to authorized levels and to replenish supplies that may be consumed or expanded by using units or destroyed by enemy action.

(3) Reserve requirements to establish or replenish an approved reserve.

(4) Project requirements to provide supplies not authorized by established allowances, but approved for a special operation or purpose to include supplies to meet civilian needs.

9–4. Planning Phases

There are three phases in planning: estimation, calculation, and modification.

a. Phase I Planning—Estimation.

(1) The estimation phase is the first step in developing an initial chemical troop list and in developing CBR supply requirements. Available data will probably be limited and will likely consist only of the total number of divisions to be employed in the operation.

(2) Chemical troop requirement calculations are based on the total troop strength and the anticipated theater organization. If only the number of divisions is known, the total number of troops can be estimated by application of the division slice data found in FM 101–10–1. The division slice is used only in the estimation phase for large forces, after which it should be discarded.

(3) Unit capabilities used in all the estimations should be verified by reference to the appropriate TOE.

(4) The amount of CBR supplies may be initially estimated by use of the ton-per-man-per-day data contained in FM 101–10–1. The factors in FM 101–10–1 do not include initial equipment of troop units, but they do include tonnages for projected equipment and similar supplies (other than civilian or other relief supplies) that are required to support troops. Buildup of theater levels can also be determined by use of these data. The chemical planner may have to make an assumption concerning the status of equipment in the force in order to estimate the initial supply requirements. It will normally be assumed that the force will have all its initial equipment. The chemical planner must balance the estimated supply requirements with the available lift tonnages.

b. Phase II Planning—Calculation.

(1) This phase begins when estimates are received from all arms and services in the form of initial tentative troop lists. The initial troop lists developed by all the arms and services must be accomplished by close collaboration, since any arbitrary unilateral change will affect the entire structure. For instance, the TASCOM or FASCOM ACofS, supply, must be aware of the total troop requirements if he is expected to provide protective clothing and other CBR defensive materiel for the entire force. Similarly, all staffs must be made aware of any changes in requirements.

(2) After the tentative troop list has been developed, the division slice and other factors suitable only for initial estimations are discarded, and refined lists of equipment and personnel are developed. (Using the troop list, personnel strength and total equipment requirements can be calculated by use of appropriate equipment lists, tables of allowance, and special mission equipment lists.) Chemical staff officers should carefully scrutinize the troop lists of the other arms and services to determine their impact on CBR operations. The threat of CBR operations will also mean that the chemical officer will be required to furnish the other arms and services with information concerning its impact on their support. The troop list should be accurate and should reflect the actual troop requirements necessary to perform the CBR combat service support mission.

(3) During this phase, revised troop and equipment lists are distributed to planning staffs of all arms and services, and concurrent adjustments are made in each list. Each planner should review the list and decide whether the next revision will increase or decrease troop spaces. This information is furnished all planners so that each planner will be aware of changes that are to be applied. Close coordination must be maintained during this phase so that adjustments in other troop lists are properly reflected in chemical combat service support or CBR multifunctionally oriented troop lists. Normally several revisions are made to bring the troop list into proper balance.

(4) The tonnages of CBR supplies must be translated into quantities of CBR supplies by item. Consideration will be given to the phased deployment of troops, strategic and tactical plans of the supported forces, enemy capabilities affecting supply requirements, amount and status of equipment, replacement factors and consumption rates, capability and dependability of the transportation system, available lift tonnages, buildup time, project requirements, reserve requirements, supply levels, requirements of other services for CBR items, and climate and terrain in the area of operations.

c. Phase III Planning—Modification.

(1) The consolidated troop list produced in phase II should provide a balanced force, each element of which is capable of performing its mission without augmentation. Phase III continues as long as the operation continues. It involves continuous refinement of troop and equipment lists after consideration of such matters as distribution of troops by zone and area, locations of facilities, and preplanned loading lists. Plans for changes, substitution, or elimination of authorized equipment will be made at this time.

(2) If the planner can tentatively make the distribution of troops and determine the location of the depots and other major installations in phases I and II, the final determination is simplified. Each planner will become increasingly aware of the deployment of the troops of other arms and services throughout the theater; therefore, he must adjust his own distribution to meet the probable load.

(3) During this phase, changes to all plans are made as dictated by policy, command direction, changes in the tactical situation, or conditions peculiar to the theater of operations.

(4) Substitution of indigenous labor for military personnel should be made at this stage. At the same time, lists of CBR equipment to be issued

for the use of the indigenous labor forces should be prepared. The substitution of indigenous labor for military personnel will throw the troop list out of balance, and several successive revisions such as those made in phase II may be required to restore it to balance. The CBR combat service support troop list will be affected considerably by the change in military strength.

9–5. Planning Factors

A planning factor is one of the tools used in planning. Factors may be represented by a fixed quantity, such as the quantity of troops in a task force. Other factors represent a ratio based on experience, such as the replacement factor (percentage of end items that must be replaced periodically). These factors are useful in planning even though the numerical values of these factors will probably change after actual experience data have been gained from an operation. FM 3–8, FM 101–10–1, SB 3–34, and SB 710–1 contain valuable data for the staff officer. The key planning factors are—

a. Troop Basis. A troop basis is a planning document that sets forth a major command's troop requirements by numbers and types of units, designations, organizations, strengths, locations, assignments, grades, and branches within a personnel ceiling prescribed by higher headquarters. An approved troop basis constitutes a major commander's authorization for personnel and equipment (TOE and TD units).

b. Troop List. A troop list is any list of military units or individuals. Generally, a troop list will contain the designations of all the units in the theater of operations or all the units served by the theater's machine records unit. This list may include units located in the area but not assigned to the command, such as attached allied units. An approved troop list does not necessarily constitute a troop basis.

c. Troop Availability. The determination of troop availability is based on several factors. These factors are the troop requirement of the command, the overall troop ceiling set by higher headquarters, and the availability of specific type units. Troop requirements are coordinated to keep them within the overall ceiling and yet have a balanced force that can perform its mission.

d. Replacement Factor.

(1) Replacement factors for selected items of chemical materiel are listed in SB 710–1. FM 3–8 contains replacement factors and consumption rates for other items of chemical materiel. If the equipment density is known for any force, replacement factors can be used to compute the normal replacement requirements to maintain the initial equipment density.

(2) Replacement factors are reviewed periodically and are revised as necessary to reflect the latest experience data, with consideration given to new concepts of operation, maintenance, and technological advancements. They are used primarily in planning and are not used when adequate demand experience has been generated.

e. Consumption Rate. A consumption rate is the average quantity of an item expended or consumed during a given time interval expressed in quantities per applicable basis (rounds per weapon per day or pounds per man per day). It usually pertains to expendable items. Consumption rates are also reviewed periodically and are used primarily in planning requirements. They also are not used when adequate demand experience has been generated.

f. Operational Readiness Float Stockage Factor. An operational readiness float consists of the major items of equipment authorized for stockage by units having a maintenance mission; these items are required for issue as replacements for unserviceable, economically repairable equipment to meet operational commitments, provided the equipment cannot be repaired in time to meet operational requirements. Stockage factors for items of chemical equipment are listed in SB 3–34.

g. Storage and Site Locations. Optimum storage area requirements for supported military operations are outlined in FM 101–10–1.

9–6. Phasing Chemical Units Into a Theater of Operations

a. Staff Coordination. Full cooperation between the chemical officers of the supporting and supported forces is essential. The support plan must be compatible with the planned buildup of the communications zone. The phasing of troops must be timely and in proper sequence, consistent with the progress of the expansion of the theater of operations.

b. Control. Until the army area has been expanded sufficiently to permit establishment of a communications zone, the logistical organization is under control of the field army commander. Chemical units destined for ultimate assignment in the

communications zone will be attached to the logistical organization and will be under the operational control of the field army commander. Sites must be obtained for chemical units so that they will be located properly for future support of the theater of operations.

Section II. PLANNING FOR USE OF INDIGENOUS LABOR

9–7. General

Indigenous labor is an important source of manpower for the augmentation of certain units. Indigenous labor should be used whenever possible and to the maximum profitable degree. The amount and type of labor that will be available must be considered in estimating service troop requirements. Auxiliary labor sources are prisoners of war, troops of allied nations, and local skilled and semiskilled civilians. Generally, this type of labor cannot be used for handling or processing special ammunition or classified materiel.

9–8. Availability and Utilization

a. Employment of Indigenous Labor. Indigenous skilled labor of an industrial nation can be used to a great advantage in most service support units. Indigenous labor is made available by coordination with the ACofS, G1, personnel.

b. Hazardous Employment. Where there is a danger of enemy action, civilian labor is not dependable. This—as well as the usual troubles resulting from language differences, local labor laws, union rules, and national customs—causes production difficulties. In addition, where large groups of indigenous labor are employed, careful consideration must be given to the extra surveillance required and to the security aspects of the operation. Continuous supervision is necessary to counteract or preclude slowdowns or acts of sabotage of any nature.

c. Equipment for Indigenous Labor. Indigenous labor must be provided the tools and equipment necessary to accomplish the task required. Commanders are required to provide the labor force with individual equipment, such as protective masks and protective clothing, and with shelter when these personnel are in a CBR environment.

d. Availability Estimates. During the planning stage, intelligence agencies can furnish estimates of the amount, types, quality, and attitude of indigenous labor that may be available in specific areas. After territory is occupied, more precise availability estimates may be obtained.

9–9. Procurement

Procurement of indigenous labor is normally conducted under the supervision of the G1 of each command. In the communications zone, indigenous labor is usually obtained from local governmental agencies such as labor offices established by civil affairs personnel. The responsibilities of agencies regarding procurement of labor and establishment of standing operating procedures concerning the employment of indigenous labor are contained in FM 41–5. The ACofS, G5, civil-military operations, maintains close coordination with the G1 and the ACofS, G4, logistics, when recruiting and using indigenous labor.

Section III. IMPACT OF CB AND NUCLEAR WEAPON EMPLOYMENT

9–10. General

Planners must be aware of the impact of CB and nuclear weapon employment on logistic support functions and must anticipate an additional load on the combat service support system.

9–11. Areas for Consideration

a. Supply.

(1) CB operations increases requirements for chemical ammunition. The nature of the agents in chemical ammunition requires separate storage of the ammunition in depots to simplify surveillance and to limit hazards from faulty or damaged ammunition. Field filling of chemical ammunition requires special equipment to transfer the agents from bulk shipping containers to the ammunition. This operation requires specially trained personnel and strict safety and surety controls. The disposal of faulty or damaged ammunition and supplies contaminated beyond reasonable decontamination limits presents special combat service support problems.

(2) CB and nuclear weapon employment increases the requirement for resupply or replace-

ment of CBR defensive equipment and supplies such as individual and unit protective equipment, detection and warning equipment, decontamination equipment and supplies, and clothing impregnation supplies.

(3) Dispersion, cover, and the use of mobile supply points may reduce the vulnerability of supply operations.

b. Maintenance. Maintenance problems increase when equipment is contaminated. Equipment from contaminated areas must be decontaminated before maintenance and repair are conducted. Maintenance units may require separate sites within the maintenance area for storage and decontamination of equipment before maintenance is conducted. A delay in decontamination may necessitate a large number of replacement items in the supply system. Requirements for covered maintenance shop space and storage space will increase. This increase will be necessary in order to provide protection for maintenance personnel and protection of supplies against contamination. A policy of conducting decontamination of equipment by using units is necessary to insure placing only essential demands on the maintenance support system.

c. Medical Evacuation and Hospitalization.

(1) *Planning.* Medical planners developing hospitalization programs must consider the possibility of increased patient admission, variations in patient accumulation, need for greater dispersion, and requirement for specialized treatment facilities as a result of CBR operations. These programs will require provision of adequate reserve of medical supplies and equipment, the capability of rapid relocation of medical units, the efficient sorting of patients by appropriate medical personnel, and the capability of rapid evacuation of patients to supporting medical facilities. The consumption rate of medical supplies, including drugs and biologicals, will increase; some of these supplies have a characteristic short shelf life or require special storage facilities. Command and control procedures must provide rapid response to sustained increases and recurring patient peakloads. Because CB weapons can cause considerable casualties resulting in sizable patient loads in relatively short periods, medical planners must emphasize the training of each individual in personal protective measures and first aid. By taking appropriate, immediate action to the effects of CB agents, military personnel will measurably improve their survival and lessen the patient workload of medical treatment facilities.

(2) *Protection.* Area coverage capabilities of the CB weapons are such that the effects may encompass medical installations, even though not a primary target. Therefore, in extensive CB weapon employment, medical planners must provide collective protection for treatment facilities to safeguard patients and medical personnel from attack.

d. Transportation.

(1) The employment of chemical ammunition introduces special safety, security, and handling problems. Common to any mode of transportation selected for a hazardous-type chemical shipment is the requirement for an escort of qualified and equipped personnel to assure a high degree of safety and security for the shipment. AR 740-32 covers responsibilities for technical escort of chemical ammunition.

(2) When chemical agents contaminate large areas, traffic may require rerouting along uncontaminated routes.

e. Personnel. CB specialists must be made available to the commander to assist in CB planning and to provide support for CB operations. In addition, enemy CB employment not only may inflict large numbers of casualties on friendly forces but also may require them to operate in a toxic environment, thereby reducing their efficiency. Personnel plans should provide for rapid replacement of large numbers of casualties and for accelerated rotation of personnel or units whose efficiency has been reduced by prolonged operations in a toxic environment.

f. Labor. The work efficiency of all categories of labor is lower in a CB contaminated area than in a noncontaminated area. Civilian labor will likely be reluctant to work in contaminated areas or in the vicinity of potential CB targets. The Geneva Convention prohibits employing prisoners of war in contaminated areas unless the prisoners volunteer. Commanders can reduce labor problems associated with CB operations by conducting adequate individual CB defense training and providing the means for individual protection against CB attack.

g. Civil Affairs. CB and nuclear operations substantially affect civil affairs activities. Requirements for CB and nuclear defense and area damage control measures and medical facilities for cities and towns increase. These requirements include shelters and protective equipment, surveys to detect and mark radiologically contaminated areas, the evacuation of vital facilities, the distribution of food and medical supplies for disaster relief, and the prevention of disease.

APPENDIX A

REFERENCES

A–1. Army Regulations (AR)

1–35	Basic Policies and Principles for Interservice and Interdepartmental Logistic Support.
11–17	Chemical and Biological Weapons Surety Program.
50–2	Nuclear Weapon Accident and Incident Control (NAIC).
50–21	Chemical and Biological Surety Program—Chemical-Biological Accident and Incident Control (CBAIC).
190–3	Physical Security Standards for Storage of Chemical and Biological Agents and Munitions.
310–32	Organization and Equipment Authorization Tables; Personnel.
310–25	Dictionary of United States Army Terms.
310–50	Authorized Abbreviations and Brevity Codes.
380–series	Security.
740–32	Responsibilities for Technical Escorts of Chemical, Biological, and Etiological Agents.

A–2. Field Manuals (FM)

1–100	Army Aviation Utilization.
3–8	Chemical Reference Handbook.
3–10	Employment of Chemical and Biological Agents.
3–12	Operational Aspects of Radiological Defense.
3–50	Chemical Smoke Generator Units and Smoke Operations.
7–20	The Infantry Battalions.
9–6	Ammunition Service in the Theater of Operations.
9–15	Explosive Ordnance Disposal Unit Operations.
17–1	Armor Operations.
20–33	Combat Flame Operations.
21–40	Chemical, Biological, Radiological, and Nuclear Defense.
29–3–1	Direct Suport Supply and Service in the Theater of Operations.
29–20	Maintenance Management in Theaters of Operations.
29–22	Maintenance Battalion and Company Operations (Nondivisional).
29–30	Maintenance Battalion and Company Operations in Divisions and Separate Brigades.
29–45	General Support Supply and Service in the Field Army.
29–45–1 (Test)	General Support Supply and Service in the Field Army.
29–50	Supply and Services in Divisions and Separate Brigades.
30–16	Technical Intelligence.
31–16	Counterguerrilla Operations.
31–45	Explosive Ordnance Disposal Service.
(C) 32–5	Signal Security (SIGSEC) (U).
41–5	Joint Manual For Civil Affairs.
61–100	The Division.
100–10	Combat Service Support.

101–5	Staff Officers' Field Manual: Staff Organization and Procedure.
101–10–1	Staff Officers' Field Manual: Organizational, Technical, and Logistical Data (Unclassified Data).
(S) 101–10–3	Staff Officers' Field Manual: Organizational, Technical, and Logistical Data; Clasified Data (U).

A–3. Technical Manuals (TM)

3–210	Fallout Prediction.
3–220	Chemical, Biological, and Radiological (CBR) Decontamination.
3–250	Storage, Shipment, Handling, and Disposal of Chemical Agents and Hazardous Chemicals.
3–366	Flame Fuels.
3–409	Impregnating Plant, Clothing, M2A1.
3–1040–209–12	Organizational Maintenance Manual: Flamethrower, Mechanized, Main Armament, M10–8.
3–1040–219–12	Organizational Maintenance Manual: Service Unit, Flame Thrower, Truck-Mounted, M4A2(D) and Service Unit, Flame Thrower, Truck-Mounted, M4A2 (IR) (Davey) FSN 1040–740–1152 (Ingersoll-Rand) FSN 1040–740–1150.
3–1040–256–12	Operator and Organizational Maintenance Manual: Service Unit, Flamethrower, Tracked-Vehicle Mounted, XM45E1.
3–4230–209–12	Operator and Organizational Maintenance Manual: Decontaminating Apparatus, Power-Driven, Skid-Mounted, Multipurpose, Nonintegral. 500-gallon, M12A1.
3–6665–205–10/1	Operator's Manual: Sampling and Analyzing Kit, CBR Agent, M19.
(C) 3–6665–205–10/2	Operator's Manual: Sampling and Analyzing Procedures, Sampling and Analyzing Kit, CBR Agent, M19 (U).
5–3740–200–15	Operator, Organizational, Direct Support, General Support, and Depot Maintenance Manual: Sprayer, Insecticide, Skid-Mounted: Gasoline Driven; 40 Gal per Hour; Fog (Curtis Model CFR–40000) FSN 3740–790–6188 (Leco Model CM–40) FSN 3740–955–9341.
5–3740–201–15	Operator, Organizational, Field and Depot Maintenance Manual: Sprayer, Insecticide, Pushcart-mounted: Mist Type, Gasoline Driven, 30 gph, 25 psi (Curtis Automotive Devices Model CAD 11080–1–A) FSN 3740–542–4866.
9–2300–224–10/3/4	Operator's Manual for Flame Thrower, Self-Propelled M132 (2350–987–8900) and M132A1 (2350–056–6809).
10–277	Protective Clothing, Chemical Operations.
10–280	Field Laundry, Bath, and Clothing Exchange Operations.
38–750	The Army Maintenance Management System (TAMMS).
750–5–15	Army Equipment Data Sheet, Chemical Weapons and Defense Equipment.

A–4. Department of the Army Pamphlets (DA Pam)

310–1	Index of Administrative Publications.
310–3	Index of Doctrinal, Training, and Organizational Publications.
310–4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (types 7, 8, and 9), Supply Bulletins, and Lubrication Orders.

A–5. Tables of Organization and Equipment (TOE)

3–77	Chemical Processing Company.
3–97	General Chemical Laboratory.

3–500	Chemical Service Organization.
8–650	Medical Laboratory.
9–520	Explosive Ordnance Disposal Detachments.
10–437	Laundry and Renovation Company, General Support.
12–67	Personnel Service Company.
29–114	Field Service Company, General Support, Forward
29–124	Field Service Company, General Support, Army.
29–139	Collection and Classification Company.
29–147	Supply and Service Company, Direct Support.
29–500	Composite Service Organization.
29–512	Headquarters and Headquarters Company, Field Depot.
29–610	Mechanical Direct Support/General Support Maintenance Teams.
30–34	Military Intelligence Company, Technical Intelligence.
30–600	Military Intelligence Organization.

A–6. Miscellaneous

TC 3–16	Employment of Riot Control Agents, Flame, Smoke, Antiplant Agents, and Personnel Detectors in Counterguerrilla Operations.
SB 3–34	Maintenance Float CBR Equipment.
(C) SB 38–26	Ammunition Supply Rates (U).
SB 710–1	Supply Control Replacement Factors for Army Materiel PEMA.
SB 700–50	Expendable Items (Except: Medical, Class V, Repair Parts, and Heraldic Items).
CTA 50–902	Clothing and Equipment (Mobilization).